

BEAVER

RX550

BEFORE 1989

BEAVER RX-SERIES
ASSEMBLY MANUAL

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ASSEMBLY MANUAL

THIS MANUAL PRINTED AND BOUND IN CANADA

Introduction

Welcome Aboard

Congratulations on receipt of your Beaver as your personal aircraft. We know that with assembling and flying the Beaver will be a most pleasant and rewarding one. Please feel free to contact your local Beaver Dealer or our Customer Service Department at the factory headquarters if you require any assistance in assembly of your aircraft. Beaver RX Enterprises Ltd.'s commitment to you carries on long after the sale is made, a commitment to do everything possible to see that you are flying the most reliable light aircraft in the world.

The RX-Series aircraft have been designed to provide the owner with low cost and responsive performance. The materials, techniques and design innovations which make up the Beaver, also make it much stronger and more stylish than any other aircraft in its class.

Happy flying,

BEAVER RX ENTERPRISES LTD.

GETTING PREPARED TO ASSEMBLE THE BEAVER

Taking Delivery from the Freight Carrier.

Depending upon where you live your kit will probably have been sent to either you or your authorized Beaver Dealer from the Factory by some common carrier, a trucking company and or sometimes the units are sent air freight. Regardless of which way the kit was sent it will be subject to damage while in transit. Inspect each of the boxes thoroughly to make sure that there have been no punctures or other types of damage. It is important to report any potential damage to the carrier as soon as possible. Remember it is the responsibility of the carrier to pay for any damage to your kit while in transit. It is your responsibility to report the damage and determine the value of the damage. Report if possible the damage on the freight bill presented to you for signing, upon receipt. While taking inventory of your kit make a note of the damage and call your dealer or the factory for a quote on the parts that require replacing. The carrier will usually send someone around to assess the damage (keep broken boxes for his review). It will likely take several weeks to get reimbursed for these parts from the freight carrier. Please remember that this situation is between you and the carrier's. Beaver RX Enterprises Ltd. cannot get financially involved in this situation.

Choosing the right location to inventory and assemble the aircraft.

Whenever possible get the kit delivered to the place where it will be assembled. The ideal situation is in a hanger or building next to the airfield where it will be flight tested. This avoids having to disassemble the aircraft and transport it to the field where it would have to be reassembled and rechecked all over again. Most airport managers or Field Base Operators (FBO's) have a corner of a hanger somewhere that you could put your unit together. Most are interested by ultralights and would welcome the opportunity to see one put together. If this is not possible, find a location where you can fully assemble the unit, and still get it out through the doorway with the wings and elevator off. This is to avoid at all costs, assembling the unit outside, possibly in the wind or rain. More than one proud new owner has seen his new ultralight be blown off his front yard by a gust of wind or dust devil. Cold or rain drenched fingers sometimes forget to tighten a bolt or screw with the obvious potential for extreme danger. Keep your assembly of the kit to a large warm, well lighted dry location, if at all possible.

The third option is to put it together as sub assembly in a car garage or a family room.

One concern that you should be aware of is being able to lock up the area where you are putting the unit together. Inquisitive passers-by can see things that would work well on something they own. If it is not possible to secure the area you will be working in, lay a blanket over all the parts until you return and do a visual check upon returning to make sure nothing has been disturbed.

Previous experience has shown that you should put the unit together in intervals of approximately 2 1/2 - 3 hours at a time. Reading the whole manual before hand and then reading ahead of each section enough to know what you will be doing next will greatly eliminate referring to the manual to valuable assembly time. This pre-reading is extremely important.

The smaller the space the more opportunity there is for error. It will take two or three times longer to assemble the unit if you are in cramped quarters.

Inventory of the Kit.

After you have received the kit and assured yourself that the kit has not been damaged or broken open by the freight carrier, it is time to open all the boxes and check to make sure everything was sent that is on the check list or inventory sheet that was included with the kit.

Note: DO NOT open the boxes and unpack until you have everything at the place where it is going to be assembled. This is because every time you transport open boxes you run the risk of tipping it over or having something bounce out of it in transport. Parts can get lost without even noticing it.

Unpacking the Boxes.

You will need a large table or piece of plywood to lay all the small parts on. This puts everything on one place and eliminates bending down all the time to pick up small items.

Putting a large blanket down will keep all the parts cleaner and avoid scratching the tubing. It is not necessarily a good idea to line the tubing up against a wall. Just like a stack of dominos, when one falls over usually the rest are not long following.

The neater it is and the more time you take to identify the various components less time it will take to complete the overall assembly.

POST ASSEMBLY PROCEDURES

If there is any time when you need to be cautious, it is now. You are now at the point where your pride and joy is finally put together. This represents the fulfillment of a dream you've had for months and maybe years. You want to get out there and test fly your new unit as soon as possible, and well you should, because you've earned it.

There are a number of steps to take to assure that your first flight in the aircraft will be a successful and enjoyable one.

1. Re-check every component on the aircraft to make sure it is attached properly and that all controls work properly and smoothly.
2. Get others to check over the aircraft.

These could be your Beaver Dealer or Factory Personnel.

Licensed Aircraft Mechanic

Member of the (EAA) Technical Committee

Owner of Other Aircraft

If several of these check over the aircraft there is more likely to be fewer problems or mistakes. This is not the time to let your ego get the best of you. Seek the advise of others.

WARRANTY POLICY

1. Aircraft Parts:

(a) Beaver Rx Enterprises Ltd. will provide, free of charge, any parts missing from an aircraft kit.

(b) Beaver Rx Enterprises Ltd. will replace, free of charge any parts supplied which are defective in manufacture.

The following conditions apply:

(a) The Warranty Registration Card must be completed and sent to Beaver Rx Enterprises within 21 days of the aircraft being received.

(b) Any claim for missing parts must be made on the Inventory Warranty Parts Response claim form included. This form must be received by Beaver Rx Enterprises no later than 21 days after the arrival of the kit. As determined by the shipping documents.

NOTE: All missing parts claimed will only be actioned under the terms of this warranty if claim is made on the Inventory Warranty Parts Response claim.

(c) One (1) only Inventory Warranty Parts Response claim per aircraft.

(d) Damaged in Manufacture parts must be returned to Beaver Rx Enterprises for inspection.

The above warranty is void if:

(a) Six months from date of shipment has elapsed.

(b) The aircraft has been flown or moved on the ground under its own power.

(c) The aircraft or its component parts have been changed in any way from the standard as set down by Beaver Rx Enterprises in its Assembly Manuals, Advisories, or other authorized literature which may be released from time to time.

(d) Warranty Registration Card has not been received by Beaver Rx Enterprises within 21 days of the aircraft being received by the customer.

(e) Customer has not completed Inventory Warranty Parts Response Form and sent this form to Beaver Rx Enterprises within 21 days of receiving the kit.

All parts supplied under the terms of this warranty are shipped at the customers expense.

2. Accessory Items:

Accessory Items are warrantied by their original manufacturer, which may not be consistent with Beaver Rx Enterprises warranty on original parts. Accessory items returned to Beaver Rx Enterprises will be sent to the OEM for service or replacement. Beaver Rx Ent. will not issue new parts prior to OEM inspection. Shipping cost is the responsibility of the customer.

3. Engine and Propeller:

The Bombardier Rotax warranty is stated as follows:

"Bombardier Rotax will replace, free of charge, engine parts defective in manufacture, and parts subsequently damaged by the failure or action of that defective part, which are required to return the engine to operating condition with the same number of operational hours on all components, within 12 months of the shipment date from the factory."

Note that any parts supplied by Rotax are not necessarily new parts and the labour and shipping costs are the responsibility of the customer.

Beaver Rx Enterprises Ltd. will offer the following additional warranty on engine and propeller.

"If, during a period of 6 months from shipment date from the factory, the customer has an engine damaged as a result of defective manufacture. Subject to the following conditions (especially #2). The customer is still responsible for any labour and shipping costs, however, Beaver Rx Enterprises will issue a voucher to the value of the cost of the labour (only) during repair, or to the value of \$100.00 Canadian Funds, WHICHEVER IS LOWEST, which can be used against the retail price of any aircraft parts or accessories supplied by Beaver Rx Enterprises Ltd."

The following conditions apply:

1. All work must be carried out by an approved Bombardier-Rotax service centre.
2. Final authority decision on defective part replacement is Kodiak Research, the Master Distributer, not Beaver Rx Enterprises Ltd.
3. Beaver Rx Enterprises will not carry out or authorize any warranty work without prior written permission of all parties involved.
4. The Warranty Registration Card must have been received by Beaver Rx Enterprises within 21 days of the customer receiving the kit.

5. Engine failure must have been a result of defective manufacture in the opinion of the Rotax Service Centre.
6. A copy of the repair invoice must be forwarded to Beaver Rx Enterprises Ltd.
7. The engine must be in as supplied condition with Beaver/Rotax carburetor, exhaust, accessory equipment and engine mounts.
8. Engine must be sent for warranty claim to either Beaver Rx Enterprises or the Rotax Service Centre complete with all the equipment noted in Section (7) above.
9. No more than 6 months have elapsed from shipment date.
10. Only one parts voucher will be applied per aircraft serial number and on the original engine supplied by Beaver Rx Enterprises and not on any replacement engine ordered by the customer.
11. Parts voucher applies to retail price only on parts or accessories manufactured by Beaver Rx Enterprises. Voucher cannot be used to purchase services or accessories supplied by any Beaver Authorized Dealer who does not buy the parts or accessories from Beaver Rx Enterprises Ltd.
12. For the propeller to qualify for any warranty, it must not have been mounted on the engine or aircraft.

Apart from the conditions stated herein, this warranty policy implies no guarantee. Nor does this policy admit any liability on behalf of Beaver Rx Enterprises Ltd., its employees or dealers.

In addition:

1. Beaver Rx Enterprises reserves the right to change the price, specification or configuration of any aircraft or its component parts at any time.
2. The sale of any aircraft, or component is conditional on the availability of that aircraft or component, and on standard aircraft configuration, at the time of shipment from the factory.

1.) Aircraft type: Beaver RX - _____

2.) Aircraft Serial Number SB - _____

3.) Engine Type Rotax - _____

4.) Engine Serial Number - _____

5.) Propeller Make and Model - _____

6.) Propeller Dimension - _____

7.) Supplied to: Name - _____

Address - _____

Telephone - _____

8.) Date of Delivery - _____

9.) Name of Dealer - _____

10.) Aircraft Built By - _____

11.) How do you Rate the Service you have received from your Dealer to date?

Comments: _____

HARDWARE & STANDARD PRACTICES

The purpose of this chapter is to acquaint the builder with standard practices and hardware as they relate to the Beaver Aircraft.

Although intended as an introduction for novices, old hands could also take this opportunity to brush up.

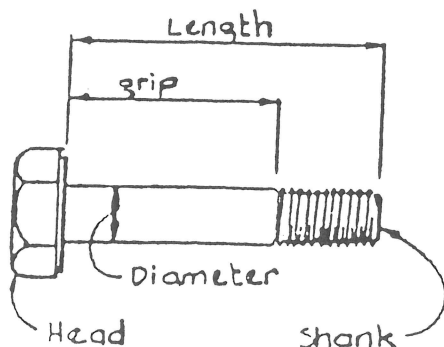
HARDWARE

With a couple of minor exceptions all hardware on the Beaver conforms to AN (Airforce-Navy) specifications. Therefore a brief explanation of AN hardware is in order.

AN Hardware Standards are defined in the National Standards Set, a publication of the U.S. Department of Defence. Because of the large number of manufacturers, and to minimize the possibility of any errors occurring, the hardware uses an alphanumeric code for sizing and grouping bolts, nuts and washers, rather than by diameter and length.

AN bolts are made of a high strength nickle chromium molybdenum alloy that is heat treated, centerless ground, and threaded. The bolts are then cadmium plated and chrome treated to resist corrosion. They have a minimum tensile strength of 125,000 lbs. per square inch and cannot normally be found at your neighbourhood hardware store.

Steel bolts are generally green+gold in color and are identified by a cross or asterisk on the bolt head along with the manufacturers initials.



Here's what the coding means;

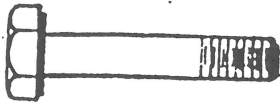
AN-Airforce-Navy Specification

3 = the diameter of the bolt shank expressed in sixteenths of an inch. In this case the 3 indicates that the bolt shank is 3/16 diameter.

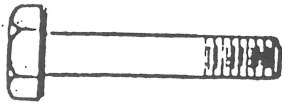
H - This letter indicates that the bolt head has been drilled for safety wiring. If the H does not appear the head is plain.

-11 - The dash number is the length of the bolt shank expressed in eighths of an inch. A #6 bolt is approximately 6/8" or 3/4" shank length. However upon reaching 1 inch length, the bolts become -10's not #8's as would be expected. Thus, there are no -8 or -9 AN bolts. Therefore a -11 is approximately 1 1/8 inches. The actual length varies slightly depending on the bolt thickness.

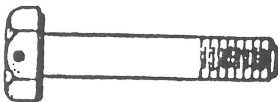
A - This letter indicates that the bolt shank has not been drilled to allow safety wiring with wire or castle nuts and cotter pins. If the letter A does not appear after the dash number the shank has been drilled.



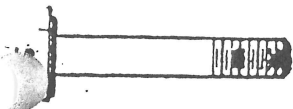
AN3-11A



AN3-11



AN3H11A



AN3H11

As an example: AN960-416 (L)

AN960 = Airforce Navy Specification Carbon steel flat washer.

416 = Diameter of the bolt for which the washer is seated. In this case 4/16 of an inch or 1/4 (AN4).

L = Indicates that the washer is "light series" or half the thickness of regular washers.

AN970 washers are large diameter washers of regular thickness carbon steel, used to spread the load over a larger area to prevent crushing the material underneath. The "dash number" system works the same as for the AN960's however is no "light series".

On the Beaver you will find several different types of nuts depending on application.

AN365 are self locking "nylock" nuts for general use. The size is once again governed by the dash number. The number indicates the diameter of the bolt in sixteenths of an inch. AN365-4 is a regular nylock nut for a 4/16" or 1/4" bolt.

AN364 is the "light series" nylock nut. It is approximately half the thickness of the regular nut and is used in situations of shear loading only. The "dash number" system is the same as for AN365.

AN363 is an all metal selflocking nut for high temperature areas. The nut is slotted and deflected inward providing a decreasing diameter that will grip the bolt.

AN310 are castle or castellated nuts, and designed for use with bolts with drilled shanks and safetied with cotter pins or safety wire.

AN320 is the half-thickness, "light series", castle nut for shear load applications.

AN350 are "wing nuts". Only use them where structural strength is unimportant and ease of use is. Always use drilled shank bolts and some form of locking pin.

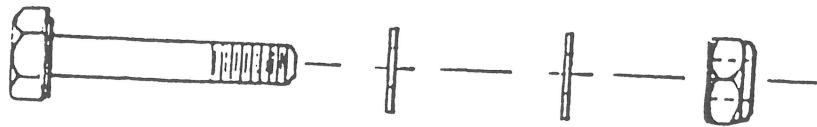
On the Beaver please note that some of the engine mounting hardware and the propeller mounting hardware are Metric Bolts and Thread forms.

Some of the muffler mounting hardware is 8AE Grade 8 nuts.

The assembly manual details where and when differing types must be used you cannot substitute one for the other. Please bear this in mind and be careful.

Throughout the Beaver assembly and maintenance manual the following key has been devised to indicate to you what Nut-Bolt-Washer combinations should be used in any given situation.

Should any fasteners require replacement at any time refer to the manual and try to use the fasteners indicated.



W/AN3-11A/W/T

Bolt placed in this direction

W - Washer - AN960 Regular Thickness

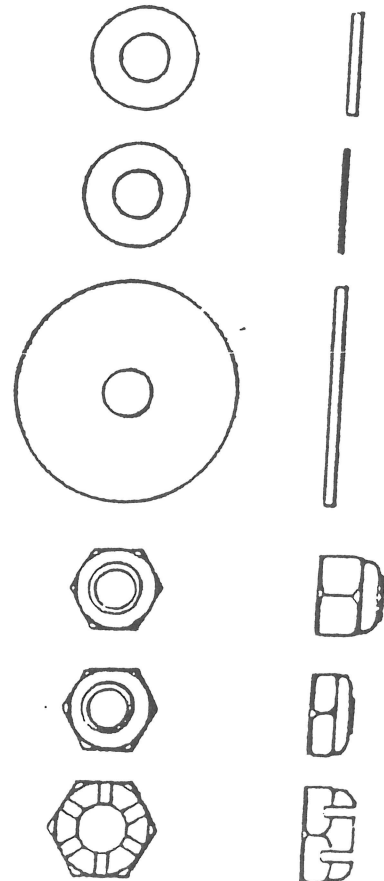
1/2W - Thin washer-AN960-XXL Half Thickness

FW - Fender Washer - AN970

T - Thick nut used where tensible loads apply AN365

S - Shear Nut-Half Thickness - used where shear loads apply only AN364

C - Castle Nut - AN310



STANDARD PRACTICES

In this section we have attempted to set out the standard procedures for the fasteners and safetying on your aircraft. Obviously it will not always be possible to follow the guidelines set down.

Hole Quality

Every attempt has been made at the production stage to ensure that all parts are an accurate fit. However, absolute accuracy is not always possible. Bolts should be thumb pressure sliding fit into a hole. If the bolt will not go through, after checking for obvious alignment problems it may be necessary to run a clearance size drill through the hole. The following are the clearance drill sizes for the fasteners holes you will encounter on the Beaver:

AN3 Bolt → Clearance hole drill size
"No. 12"

AN4 Bolt → Clearance hole drill letter
"No. 12"

AN5 Bolt → Drill bit size 5/16"

Use a hand drill. The vibration and speed of a power drill may cause the hole to become oversize.

Any drill, no matter how sharp or how skilled the operator, will leave burrs. Burrs left on holes or under fasteners can be a major cause of stress which could ultimately lead to damage and to a lowering of the structural integrity of the fastened joint. Holes can be deburred quickly and easily by hand spinning a larger diameter drill in the hole. Attempt only to remove the burrs, not cut into the material beneath. Mechanical deburring tools, such as those used in electric drills, should be avoided until such time as the operator has a little experience.

Of the bolt hole is oversize, check with the dealer, the manufacturer or an A & P mechanic before drilling out to the next size. There may be insufficient material for edge clearance to provide a sound joint.

Bolts

When installing bolts, install them in such a manner that if the nut or fastener loosens or falls off, forces acting on the bolt such as gravity, air or wind loads and other obstacles such as grass will tend to keep the bolt in place. Thus, always try to install bolts from the top down and from the front towards the back.

When selecting a bolt, the grip length, that is the unthreaded portion of the shank, should be approximately equal to the thickness of the materials to be joined, plus washers spacers etc. No more than one full thread should be below the surface of the materials to be joined.

Washers

Washers should be used under both the head of the bolt and under the nut. They prevent having threads within the structure and prevent the nut from bottoming out. They help distribute the load and assist in lining up the locking hole when torqueing castellated nuts.

Should a bolt require any more than 2 regular thickness washers under the nut, you should consider going to the next smaller length bolt.

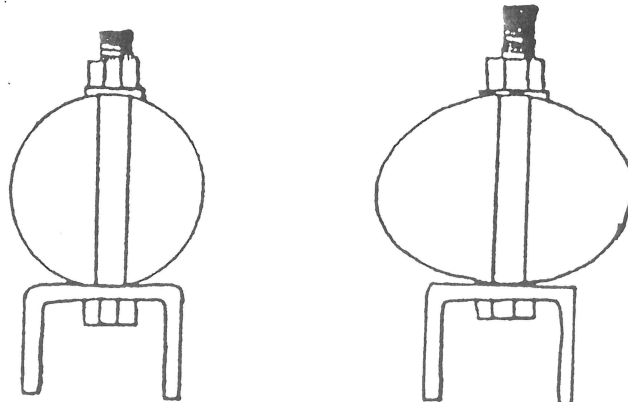
Nuts

When installing nuts at least 1 1/2 threads should be visible when the nut is torqued correctly. If more than 4-5 threads show you should consider going to the next shorter bolt. Should less than 1 1/2 threads be showing you must either use a larger bolt or use the thinner washers. This is to ensure positive locking.

It is recommended that self locking nuts be replaced after each use. However they may be reused provided that the running torque on the nuts exceeds 3 lbs./ft.

Always tighten nuts by holding the bolt and turning the nut. This prevents possible damage to the structure and galling and scratching of the bolt. A damaged bolt could have stress points and corrosion problems if the cadnuim-plating is scratched off. Bear in mind that the bolt shanks will be hidden and any problems may not be immediately obvious.

Always torque nuts. Use clean, dry hardware (no lubricants) torque the nut while holding the bolt. On unsupported tubing, or any other crushable material, ensure that the fastener is snug without distorting the parts. See diagram below.



Use good quality multi-hex sockets and wrenches. They ensure accurate control and feel with minimum damage to the fastener. Avoid adjustable wrenches, the possibility of damage to the structure and fasteners is too great, should the operator slip or the jaws of the tool move.

Cables

Cables should be inspected periodically. They require a lot of care and attention. Checks should be made for kinking, corrosion or broken strands. Your aircraft is fitted with stainless steel control cables. Cables are especially prone to an excessive number of broken strands around pulleys. By running a soft cloth along the cable, broken strands can be detected by the cloth snagging. A small number of broken strands evenly distributed along the cable are acceptable. However, should a large number appear in any one place or should any corrosion or kinking take place, the cable should be replaced as soon as possible. You should contact your dealer or the manufacturer for replacement cables.

Torque Values

Whenever structural connections are made other than through unsupported tubing the nuts should be torqued according to the following table. It is recommended that a torque wrench is used. Considering the amount of use a torque wrench will be during the construction and maintenance of the Beaver, and the relatively inexpensive purchase cost, now would be a good time to buy one if you don't already own one. Remember it is a delicate instrument. Have the calibration checked regularly.

The following values are in inch-pounds. To correct these values to foot pounds divide the figures by 12.

Bolt Size (Dia)	AN Code	Torque Value (in lbs.)
3/16	AN3	20-35
1/4	AN4	50-70
5/16	AN5	100-140
3/8	AN6	160-190

When torqueing locking nuts (AN363, AN364, AN365) torque the nut to a figure approximately at the centre of the range given.

When torqueing castle or castellated nut (AN310, AN 320) tighten the nut to the lowest value. If locking holes do not line up, slowly tighten until locking can be accomplished. Be careful not to exceed the upper torque limit. If locking cannot be accomplished within the torque range it will be necessary to shim the nut by placing 1 or 2 AN 360-XXL light series washers under the nut until locking can be safely accomplished. This operation can become time-consuming,

however the security gained is more than worth the time spent.

SAFETYING

All hardware and fasteners on your aircraft should be safetyed to prevent loosening; backing out or possibly even falling out with the obvious catastrophic results.

In aviation safetying is achieved by wiring, pinning or clipping to positively lock a nut or bolt to prevent it loosening.

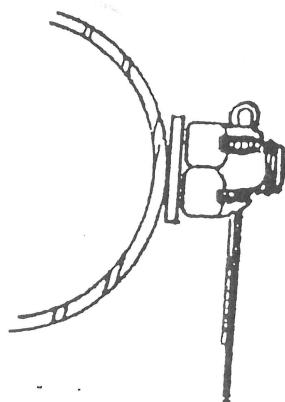
Torque is an important factor, however since it is not always possible to achieve the desired torque on crushable materials, e.g. tubing or wood, safetying becomes doubly important.

Self locking nuts were described in the hardware section under AN363, AN364, and AN365, so further discussion here should not be necessary.

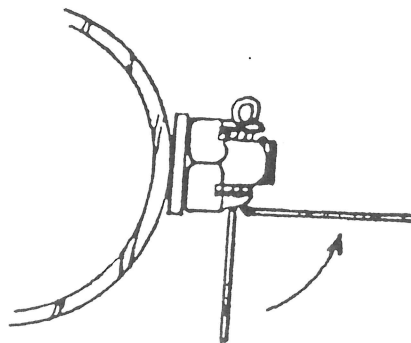
Lock washers or star washers are not recommended, they provide only marginal locking quality and can easily score the surface underneath.

Critical Nut and Bolt combinations should be safetying by using a castle nut (AN310 or AN 320), a bolt with a drilled shank and a cotter pin as in the diagrams below. This method should be considered mandatory combinations subject to rotation.

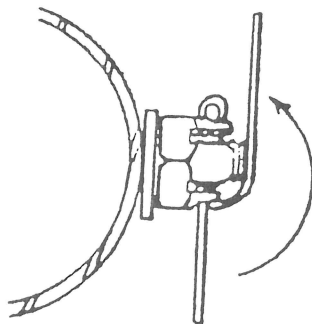
1.)



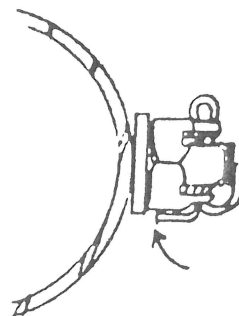
2.)



3.)

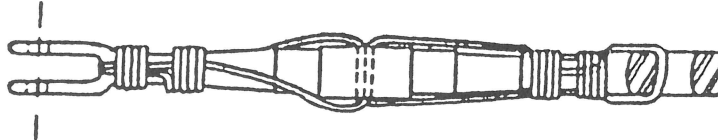


4.)



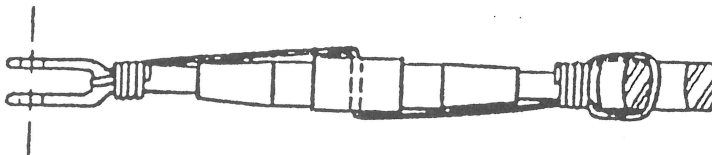
All turnbuckles must be properly wired after desired tension has been met. Use one of the two methods described below. The double wrap method is preferred although the single wrap method is adequate.

DOUBLE WRAP



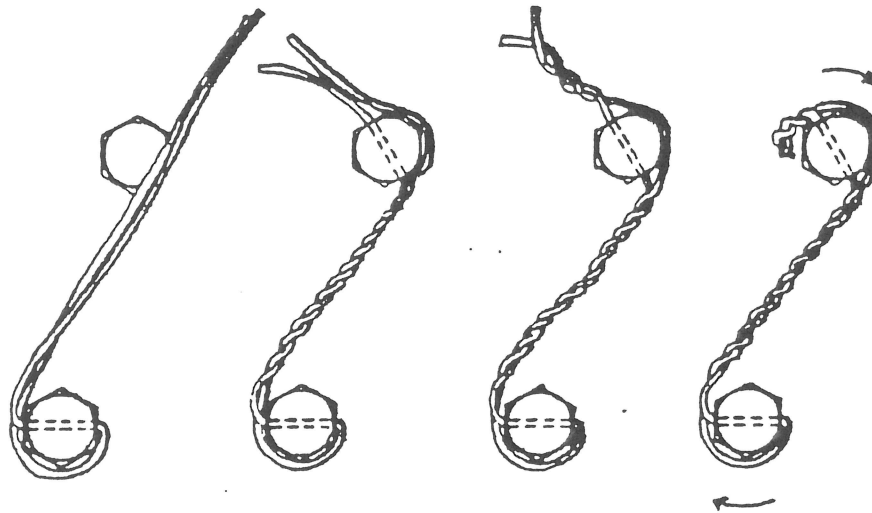
Use two separate lengths of the proper wire. Run one end of the wire through the hole in the barrel of the turnbuckle and bend the end of the wire towards opposite ends of the turnbuckle. Then pass the second length of the wire into the hole in the barrel and bend the ends along the barrel on the opposite side first. Then pass the wires at the end of the turnbuckle in opposite directions through the holes in the turnbuckle eyes or between the jaws of the turnbuckle fork as applicable, laying one wire along the barrel and wrapping the other at least four times around shank of the turnbuckle and binding the laid wires in place before cutting the wrapped wire off. Wrap the remaining length of safety wire at least four turns around the shank and cut it off. Repeat the procedure at the opposite end of the turnbuckle.

SINGLE WRAP



Pass one length of wire through the centre hole of the turnbuckle and bend the wire ends towards opposite ends of the turnbuckle. Then pass each wire end through the cable eye or fork and wrap each wire end around the shank for at least four times, cutting off excess wire. After safetying, not more than three threads of the turnbuckle terminal should be exposed.

Bolts in a forging or casting should be secured with safety wire. Always use aircraft stainless steel safety wire. Not the more common carbon steel wire. Wiring should be accomplished so that the direction of force tends to tighten the bolts. Wire should be twisted 4 to 6 twists per inch. See diagrams:



In some applications it is acceptable to secure castle nuts and wing nuts with safety clips or rings. In this situation use good quality heat treated key rings. Not formed wire rings. Check them by bending them with 2 pairs of pliers. They should resist bending and should not break.

All critical fasteners on your aircraft must be safetied and your preflight inspection should include a check that all safetying is secure.

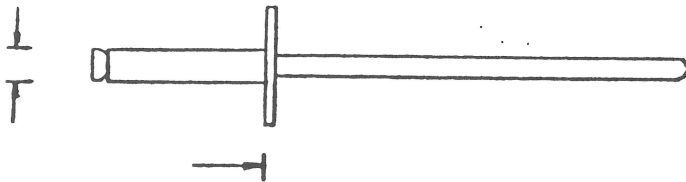
RIVETS

During the constuction of Spectrum RX#series aircraft the builder is required to set blind rivets.

Rivets are identified by a code system which describes the physical characteristics and material used in the rivet.

For example:

3/16" x 3/8" S.S. rivet.



The first figure indicates the diameter of the shank of the rivet before setting.

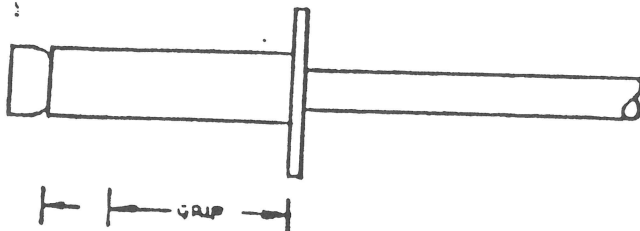
The second figure, or grip length, describes the total thickness of material the rivet is designed to fasten after it has been set.

S.S. indicates that both parts of the rivet, the rivet itself and the nail-like mandrell, are made of stainless steel. A.A. would be a rivet composed entirely of aluminium alloy. S.A. indicates a composite rivet, steel mandrell and aluminium rivet.

As always, the hole must be cleanly drilled and be free of burrs. A rivet swells as it is compressed, and therefore the hole should be a slight over size or 'clearance' size. the following clearance drill sizes are recommended.

1/8"	No 30 drill
5/32"	No 22 drill
3/16"	No 11 drill

Loose rivets can be identified by measuring the diameter and the length. The length of an unused rivet is approx. 25% to 30% longer than it's intended grip length. Thus a $\frac{3}{8}$ " grip length rivet will be $\frac{1}{2}$ " long before it is set.



Be extremely careful with the material. Steel can substitute for aluminium rivets but not the other way around. Aluminium rivets are intended for non-structural applications only. Rivets can be told apart by weight and appearance. Aluminium rivets are lighter than steel rivets and have a flat silver appearance compared to the lustrous-chrome look of steel rivets.

The purpose of this section is to acquaint the owner and/or the operator of the Beaver Rx-35 or Rx-550 with some of the preparation and procedures which should be followed in the event that you wish to use the aircraft in salt water.

Tests conducted by the U.S. Navy at it's Research Station in Langley, Virginia have shown that any aircraft that flies within 500 ft. of the ocean is subject to the same salt concentration as any aircraft that actually lands on the salt water. Even if your aircraft is not a float plane, if you operate anywhere near salt water you should pay special attention to this section. Navy patrol planes such as the P3 Orion are always given a fresh water wash down after low altitude missions even though they never actually contact the water.

Pure aluminum is too soft for basic aircraft structure, although it is extremely corrosion resistant. Alloys of aluminum used in aircraft structure are affected by salt water. During fabrication the material is either anodized, or preserved by dipping each piece in a preservative solution, called Alodine 1200 then priming it with zinc chromate or an epoxy before painting. Parts are joined by riveting or bolting.

The stabilized dacron used in covering needs no special preparation or maintenance other than the usual cleaning, periodic inspection and by keeping the sails ventilated and covered whenever the aircraft is stored outside. It is highly recommended that the sailcloth be periodically treated with a cleaner/protectant designed for use on zero porosity polyester fabrics.

Some operators have found that application of clear enamel aircraft finish such as Stits Aircraft Clear Aero-thane Enamel A0-100 or equivalent will preserve the fabric, protect it somewhat from degradation due to ultra-violet light, reduce porosity and improve performance generally as a result of the improved surface finish.

Sea Planes require all the same maintenance and inspection as landplanes, in regard to engines, controls, landing (amphib) gear, instruments, and radios (if fitted). Daily maintenance is more important if the aircraft is based in salt water. The ship must be kept CLEAN and free of salt deposits. In temperature climates, corrosive action is slow. In the warm and humid atmosphere of the tropics, corrosion prevention requires almost daily attention.

Corrosion prevention principally means washing. Washing should be done with hose spray. Spray should be directed into all corners and crevices. Corrosion is unlikely to occur on an outside surface whether anodized, painted or bare. It should be noted at this time that bare aluminum should never be used on any aircraft intended for salt water operation. The hose should be directed into all control surfaces hinges. All parts of the amphibian landing gear and around external fittings; flush out wheel pockets and pants, and the brakes.

With the engine running spray a fine mist into the engine cooling fan intake. There should be enough fresh water sprayed in to remove the harmful and corrosive salt encrustations on the fan and head, but not too much water that will choke and stall the engine, and possibly supercool the engine and crack the castings or other components.

After a trip to the coast, some pilots land in the first fresh water they come to, douse the aircraft, extend the gear, etc. Seagulls do it that way! Park the aircraft in the rain if you have a rainy season. Its easier and faster than hosing, and possibly more thorough.

Spray the engine with a mist of very light oil.

Erosion, rather than corrosion is the problem with propellers. Dirt, dents, and pitting greatly spoil a propellers thrust and can severely reduce it's structural integrity. Propeller leading edges can be protected with tape designed for the purpose and available from sport aviation suppliers.

Prospective trouble spots can be detected by close inspection and sometimes by a change in propeller noise or vibration. Any major repair to propellers is a specialized job and it should be referred to a recognized propeller repair station for service.

Corrosion proofing during assembly is probably the most important part of ensuring your aircraft a long and hopefully trouble-free operational life. These are essential steps usually omitted in the assembly of pure landplanes.

All tubing parts that will remain open after assembly should be treated internally with a corrosion protectant that conforms to MIL-C-16173D Grade One or similar. This forms a protectant film that can be brushed on, or swabbed on it with a porous rag or piece of sponge attached to a length of tubing or similar. Try to get as good a coverage as possible. These protectants "dry" to a film. The excess or spills can be removed with a cloth soaked in paint thinner or acetone.

All parts which can be sealed up should be sealed with silicone sealant after pouring in a small amount of protectant which conforms with MIL-C-16173D Grade Two or similar.

All non-moving fasteners and rivets should be treated with zinc-chromate primer. Only use enough zinc-chromate to coat the threads and shanks or bolts and rivets. In locations where plates and brackets, etc. must be put together face to face. Place some primer on the mating surfaces. Don't use too much and wipe up any excess. Remember, zinc-chromate primer, like any flat finish paint, will attract and retain moisture and thus promote the very corrosion we are trying to prevent.

All moving fittings should be treated and coated with 'Cosmoline' or equivalent, these are thick heavy greases usually brown in colour.

RX-SERIES ASSEMBLY
SALT WATER OPERATION

They can be thinned and painted on fittings. It can also be used on turnbuckles and clevis'. The heads and nuts of exposed but non moving fasteners can have the MIL-C-16173D Grade One painted on with a small brush.

The steps noted above cannot, unfortunately, be properly carried out selectively or progressively. To ensure complete protection for the aircraft ALL the preventative steps must be carried out at initial construction time. All corrosion preventative treatment must be maintained and must be replaced whenever disturbed for maintenance or repair.

Don't be afraid of corrosion. All-metal aircraft built before World War II are still flying after 40 years in salt water operation. Apply the attention needed and pay for a bit of special proofing at construction time. It takes a bit of work to keep corrosion under control but that, I'm sure you'll agree, is a small price to pay for seagoing wings. After a full season of flying get a thorough professional inspection by your dealer, A.M.E., or factory rep., including cleaning and paint touch-up.

For further information on seaplane operation contact your dealer or write: United States Seaplane Pilots Association
421 Aviation Way
Frederick, Maryland
21701

TRIMMING THE RX-35 AND THE RX-550

Trimming of the Rx-series aircraft is accomplished in the following manner.

No difficulty should be encountered in stability about the longitudinal (rolling) axis. By following the instructions given in the assembly manual with regard to wing washout and aileron rigging the natural, inherent stability of the aircraft will be apparent.

Stability about the vertical (yaw) axis is influenced mostly by the action of the propeller wash and engine torque reaction (P-Factor). On low powered aircraft the problem is less noticeable. If, in cruise configuration, the aircraft has a turn that cannot be accounted for by some irregularity in the airframe. (Stabilizer out of alignment, washout or sweepback) a fixed tab of approximately 36 sq. in. - (12 in X 3 in) can be attached to the trailing edge of the rudder. Experiment with different offsets to get the desired cruise performance.

Longitudinal stability about the lateral (pitching) axis the Rx-series aircraft is compromised by several factors. Firstly, the weight of the pilot is considered as part of the loaded weight and balance and secondly, the high thrust line of the aircraft causes a nose down tendency which increases as more power is applied. Trimming the aircraft in the pitch axis is therefore going to be a compromise especially on a training aircraft with greatly varying weights of the (front seat) pilot.

It is critical that a weight and balance calculation is carried out, before each flight to determine whether or not the aircraft's centre of gravity is within the limits set down in the weight and balance section of the Assembly and Maintenance Manuals.

Addition of Full Enclosure, Instruments, etc., will move the empty centre of gravity forward. Addition of up to 5-lbs. of ballast on the tail is permitted if necessary.

The "hands-off" trim configuration is at the discretion of the pilot. Because of the high thrust-line, the power setting will have a marked effect on the pitch trim stability. Some pilots prefer to trim the aircraft at cruise power setting, while others prefer "power-off" trim stability.

Once the centre of gravity, weight and balance calculations have been accomplished, trimming the aircraft is done by raising or lowering the leading edge of the horizontal stabilizer by varying the thickness or number of the spacers between the apex plates and the #953 Bracket. The #2314 strut ends must be adjusted to ensure that the leading edge of the horizontal stabilizer is straight. It is permissible to remove the back-up nuts up the #426 fittings to shorten the #2314's if required.

BEAVER RX-550 AIRCRAFT ASSEMBLY
 SECT.B STEP #1: MAIN WING ASSEMBLY

Parts Requirements

Part No.	Description	Qty. Req'd
020	End Plug Dowell	2
505	S.S. Tang	4
950	1" Bracket	20
982	1" "No twist" Bracket	4
2002	Drag-Anti Drag Cable	2
2003	Drag-Anti Drag Cable	2
2006 L&R	Leading Edge left & right	lea.
2006-04	Front Spar Tip (taped to wing spar)	2
2007 L&R	Trailing Edge left & right	lea.
2008	Compression Strut Stn.1	2
2009	Compression Strut Stn.2	2
2010	Compression Strut Stn. 3&4	4
2012	Compression Strut Stn. 5	2
2025	Compression Strut Stn.6	2

Bolt Requirements	Qty.	AN Hardware	Qty.
AN4-15A	24	AN393-9	4
AN4-23A	2	(clevis pin)	
AN4-24A	4	AN390-2-2	4
AN4-25A	2	(cotter pin)	
AN4-26A	2		
AN4-30A	2		
AN43B-23A	2		
AN43B-24A	4		
MS27039-4-44	8		

Nuts	1/4"	Qty.	Washers	3/16"	Qty.
S -		24	1/2 W -		4
T -		26		1/4"	
			1/2 W -		32
			W -		84

Miscellaneous Qty.

3/16" x 1/4" grip SS rivet	4
Safety Wire	8 ft.

SECTION B. STEP #1: MAIN WING ASSEMBLY

1). Lay the wing spars #2006-R (right L/E), and #2007-R (right T/E) on floor. If room permits, both right and left spars can be assembled simultaneously. Lay the L/E & T/E about one foot apart.

2). Insert #2006-04 sleeve (taped to main spar for shipping) onto outboard end of L/E. Sleeve should reach a stop with holes in spar and sleeve aligning. Rotate sleeve 180 degrees if required.

3). At this point confirm proper identification of left and right spars.

a) [use ref.dwg.#1:01] Between stn.#4 & stn.#5 on each spar there is a 3/16" hole drilled for locating the wing strut bracket. (see detail 'A')

b) When assembling spars it is important to consider the position of them in relation to the aircraft. There is now a top side, bottom, forward and rear.

NOTE: Position sleeve retainer rivets to inside of the wing if possible.

4). Refer to dwg.#1:02 for placement of brackets. Begin by placing all brackets at appropriate stations, and initially finger tighten nuts only. Take note where manual calls for "finger tighten only" as this will apply to areas where the sail or other parts will be attached later. All other bolts must be properly torqued.

a) STN 1. FRONT SPAR:

W/#505 narrow tang/#950 comp.st.brkt./AN4-30A/W/T.

Bolt goes through the spar from the inside of the wing on the compression strut side. The Stn. 1 bolts hold the sail grommets later in the assembly.

-Finger tighten only for now.

b) STN 1. REAR SPAR:

1/2W/#505 narrow tang/#950 comp.st.brkt./AN4-26A/1/2W/T

-Bolt direction is from the inside out.

-Hand tighten only.

-Check now that you have the rear spar rotated properly so that the tip angle is as shown in Dwg.#1:01 Detail 'B'

c) STN 2. FRONT SPAR:

1/2W/MS 27039-4-44/#982 no twist/W/T.

-Torque to 40 in. lbs.

-Bolts are inserted from the forward side of the wing on the L/E and from the rear side of the T/E at stns.#2-#5 inclusive.

-Set the #982 bracket parallel to the front spar, then drill #11 and secure with 3/16"x 1/4" grip SS rivet.

- d) STN 2. REAR SPAR:
 1/2W/AN43B-24A/#982 no twist/1/2W/T.
 -Torque to 30 in. lbs.
 -Set the #982 bracket parallel to the rear spar, then drill #11 and secure with 3/16"x 1/4" grip SS rivet.
- e) STN 3. FRONT SPAR:
 1/2W/MS 27039-4-44/ #950 comp.st.brkt./W/T
 -Torque to 30 in. lbs.
- f) STN 3. REAR SPAR:
 1/2W/AN43B-24A/#950 comp.st.brkt./1/2W/T
 -Torque to 30 in. lbs.
- g) STN 4. FRONT SPAR:
 1/2W/MS 27039-4-44/#950 comp.st.brkt./W/T
 -Torque to 40 in. lbs.
- h) STN 4. REAR SPAR:
 1/2W/AN4-24A/#950 comp.st.brkt./1/2W/T
 -Torque to 30 in. lbs.
- i) STN 5. FRONT SPAR:
 1/2W/MS 27039-4-44/#950 comp.st.brkt./W/W/T.
 -Finger tighten only for cable installation later.
- j) STN 5. REAR SPAR:
 1/2W/AN4-23a/#950 comp.st. brkt/1/2W/T.
 -Finger tighten only for cable installation later.
- k) Between Stn 5 and 6 - REAR SPAR only:
 W/W/AN43B-23A/W/T is installed as a hinge point for aileron.
- l) STN 6. FRONT SPAR:
 1/2W#950 comp.st.brkt./6W/#020 wood plug/AN4-25A/1/2W/T.
 Bolt direction goes in from the inside of wing.
 -Finger tighten only.
- m) STN 6. REAR SPAR:
 1/2W#950 comp.st.brkt. /AN4-24A/1/2W/T
 -Bolt goes in from the inside of wing.
 -Finger tighten only.
- 5). Spread L/E & T/E about 4' apart to make room for placing compression struts between them. From stn. #1-#6 the corresponding parts are #2008; #2009; #2010; #2010; #2012; #2025. Have bolts ready at each stn. (Comp. struts are fastened simultaneously with drag cables.)
 - a) Compression struts are fastened to #950 bkts. using W/AN4-15A/W/S.
 - b) All bolts must be inserted from top side of brkt. with the nut on bottom.

6). DRAG WIRE INSTALLATION:

Attach #2002 drag wire (tang end) to the outside of the #950 brkt. at Stn.5 on T/E #2007 using the existing bolt previously installed finger tight. Use a washer here between the nut and tang, then tighten bolt up properly.

7). Attach the 2003 drag wire (tang end) to the front spar at Stn.5. as outlined in previous step. Do not put the Stn.5 or 6 comp. strut. in yet.

8). At Stn.4, position comp. strut #2010 and cross #2002 drag wire from T/E diagonally to L/E (stn.4). Slip the wire into the slot in the nylon plug end with the nico stops on each side of the plug. Fasten the comp. strut to the #950 bracket using a 1/2W/AN4-15A/1/2W/S (installed from the top)

9). Run #2003 drag wire across to stn.4 at T/E and install comp. strut as previously detailed.

10). The cables will start to get tight as you move to Stn. 3. Criss cross cables and attach #2010 in the same manner as stn.4 was done. This will start to take a little pulling. It helps to have the inboard end of the wing butting up to something solid or another person pulling the compression strut into place to align the holes then push through the AN4-15A.

NOTE: When pulling on the strut with the wire in place it is necessary to hold the wire from slipping off until the bolt is put through the bracket.

11). Check that the rivets are set in the #982 brackets at stn.2 before installing drag cables. Attach #2009 comp. strut with cables.

12.) Attach turnbuckles (installed on drag cables) to tangs positioned at stn.#1 L/E & T/E using AN393-9's with a thin washer and a cotter pin. The nut should be on the front side of L/E and rear side of T/E to accomodate sail installation. For this reason it is not necessary to lock the nut down hard. Fill the bolt up with washers and snug the nut temporarily so that the drag wire is properly tensioned. Align the SS tangs in line with cables by bending slightly with crescent wrench.

13). Before proper drag wire tensioning can take place all of the compression struts must be installed.

a) Install #2012 comp. strut at stn.5

b) Check that #020 wood plug is in place at stn.6 L/E and install #2025 comp. strut. (Leave sail bolts loose!)

14). The wires in the outboard bays now should be comfortably tight with about a 1" deflection on a 10-15 lb. pull. Tighten up the turnbuckles at Stn. 1 to create a slightly greater tension, and be sure to give an eye to the straightness of the spars.

15). Before we go on you may want to know a little about the importance of the drag wires.

The drag wires main function (as the name implies) is to retain rigidity in the horizontal plane of the wing due to the varying drag and anti-drag loads, which the wing's aero dynamics create at different speeds and angles of attack. The sweep back setting of the wings are held by the drag wires and is adjustable slightly with the turnbuckles at stn. 1. Equal drag cable tensions between the two wings is very important to equalize the twist setting. This has a final adjustment after the wings are mounted to the airframe. For now it is important to follow the turnbuckle setting method with the wings off of the fuselage.

16). SETTING DRAG WIRES

Before starting the accurate cable tensioning, make sure that the Station 1 bolts going through front and rear spars have been tightened down.

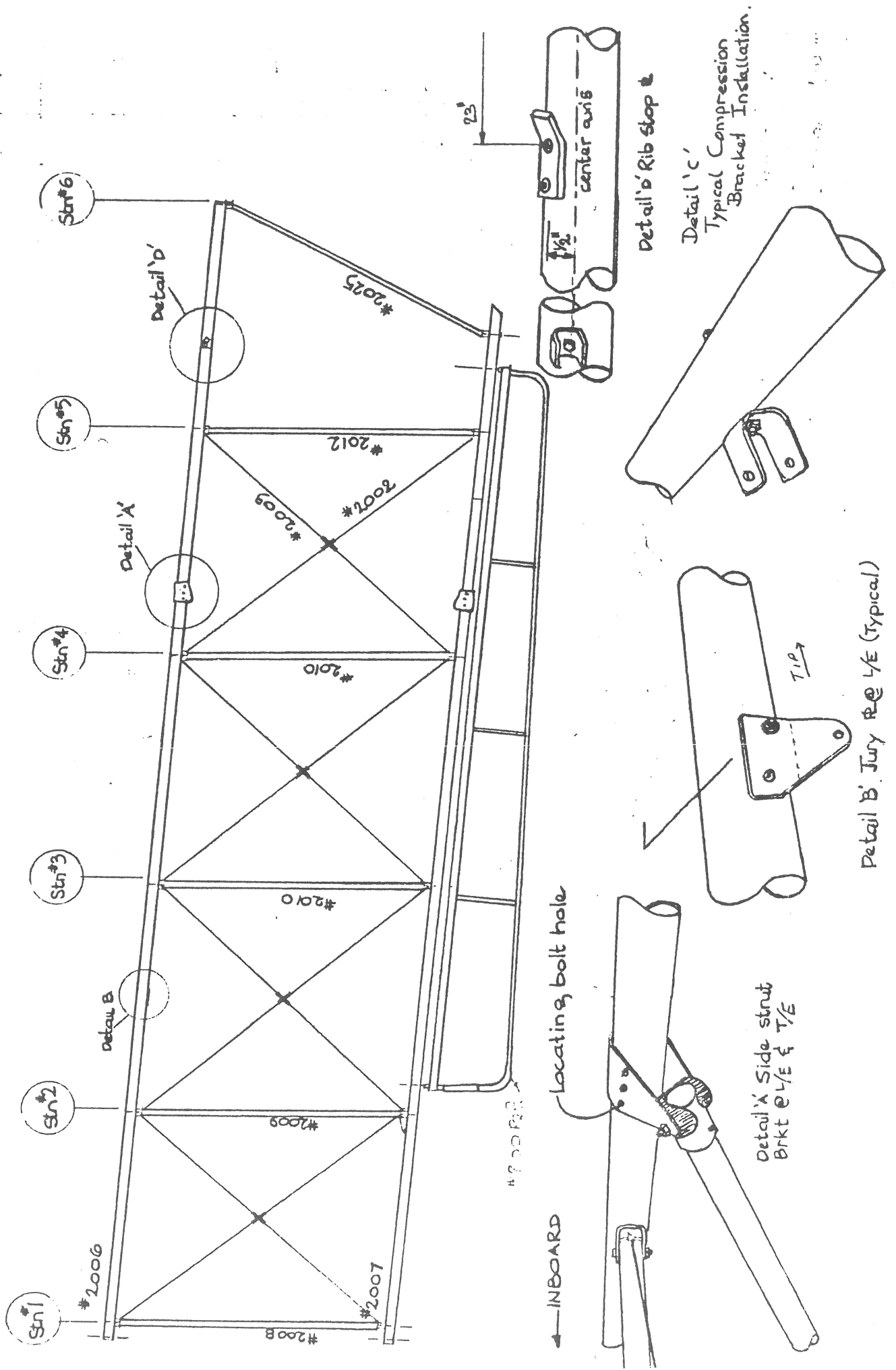
- a) Stand the wing up on its leading edge as shown in drawing 1:03 (check that spar is level).
- b) Set equal amounts of sweep on the left and right wings while continually checking for trailing edge straightness. You should be able to see straight through the eyebolts on the trailing edge.
- c) Adjust the turnbuckles until you have achieved the proper off-set. The tolerances for the offset are from 4 1/2" to 4-5/8", but most importantly keep both wings to the same increment, within 1/32".

17). SAFETY WIRING

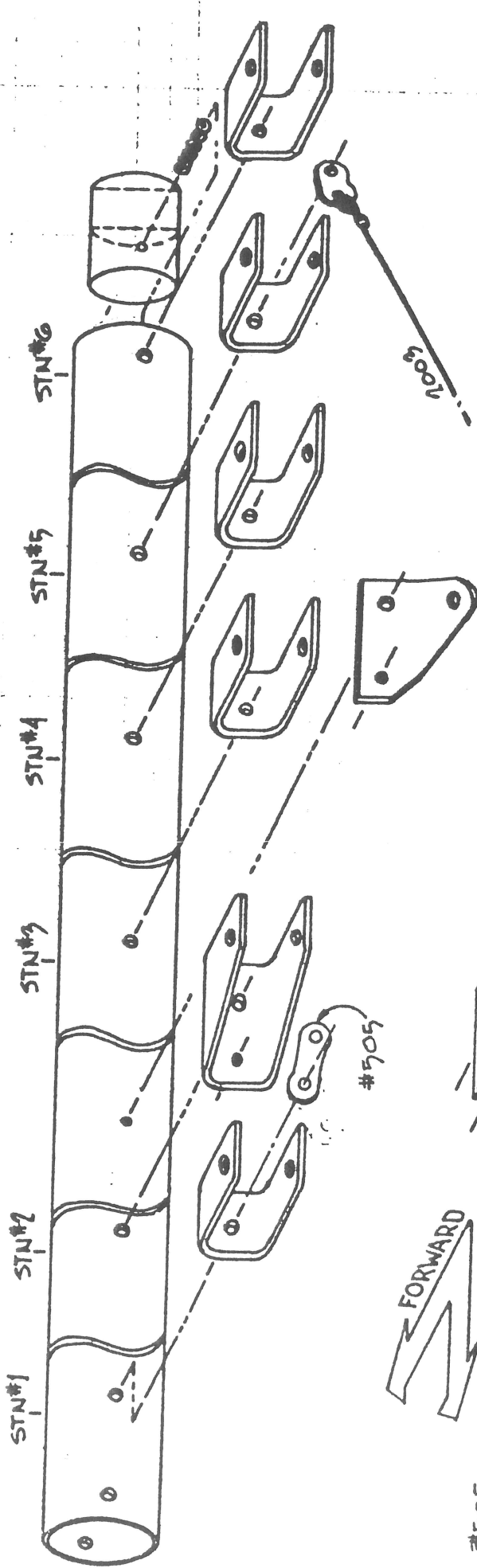
Now that the cables are set, lock wire the turnbuckles as demonstrated at the start of the assembly manual. Also lockwire the cable intersections in all the drag wire bays as shown in dwg.#1:03, using 6" pieces of lockwire. The turnbuckles MUST be done now!

Rx-550

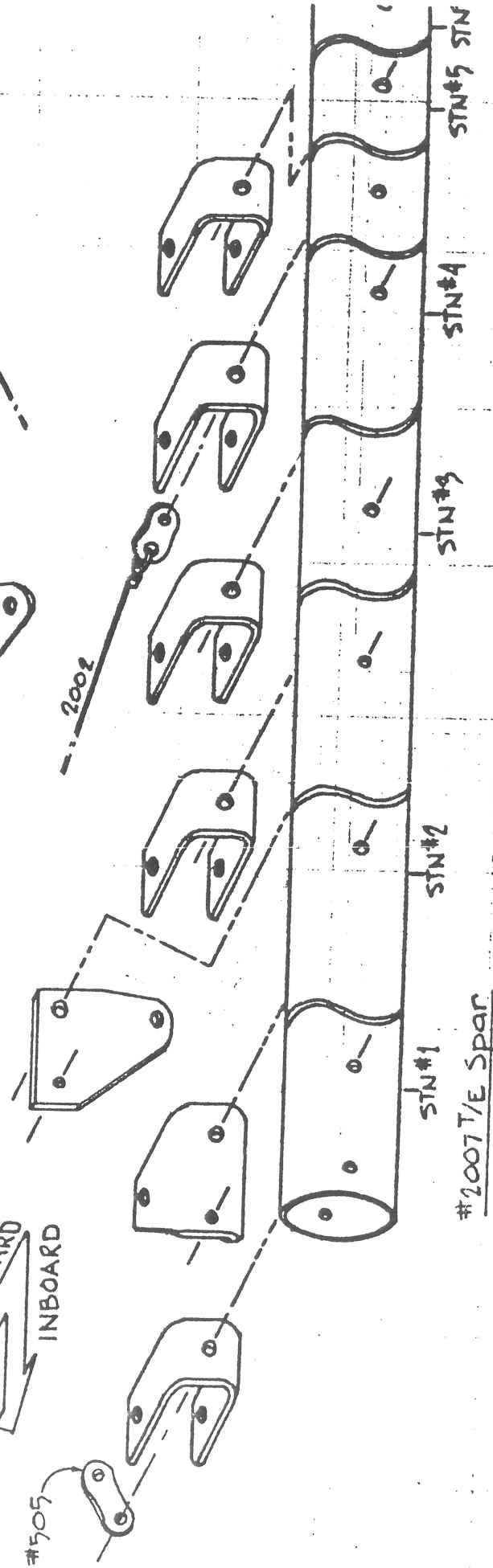
DWG, 1:01.



#2006 L/E Spar



FORWARD
INBOARD



DWG: 1:03

WING TOP VIEW

Tightening upper wire moves top spar

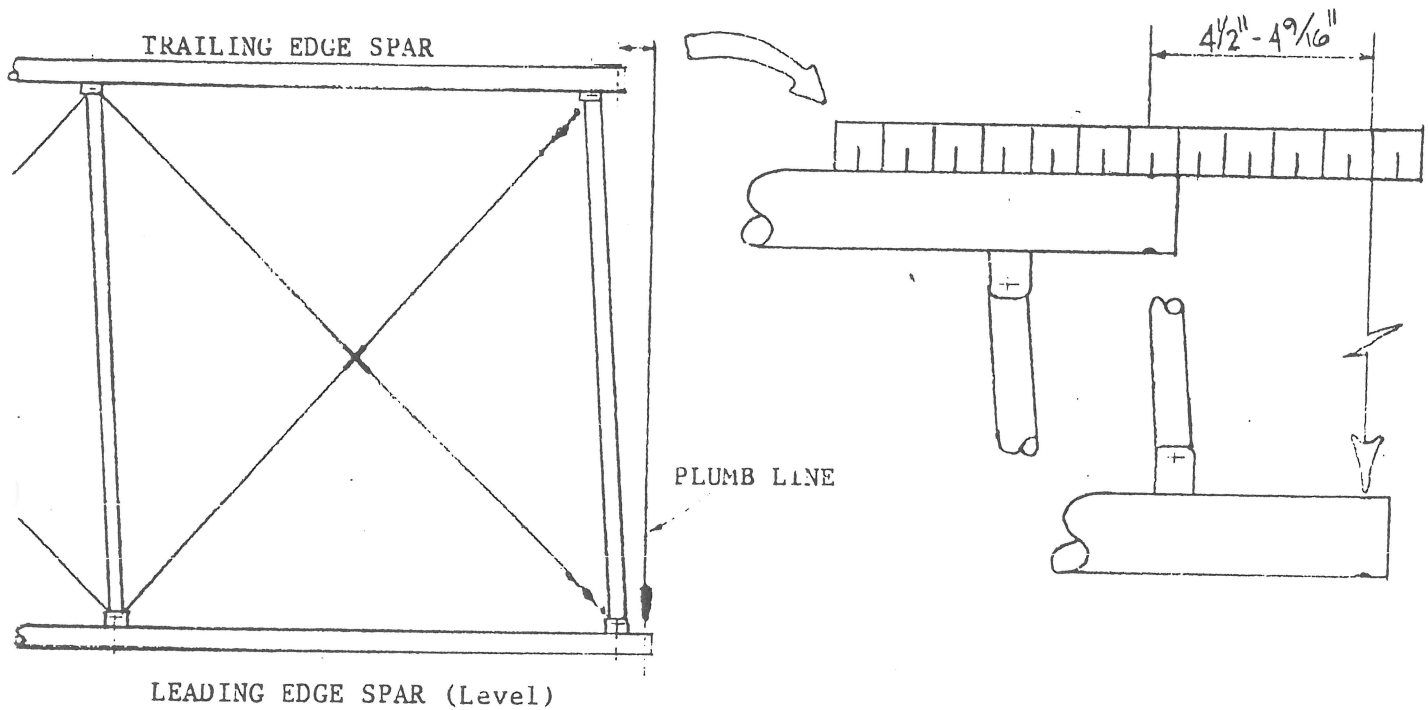
Tightening upper wire curves spar

For reference after wing mounting:

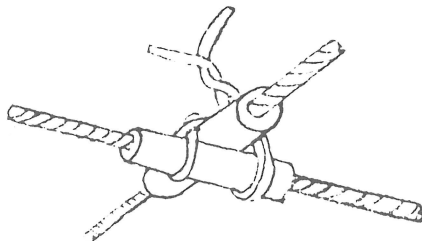
When wing is installed: (Section C1)

Tightening upper wire decreases twist (washout)

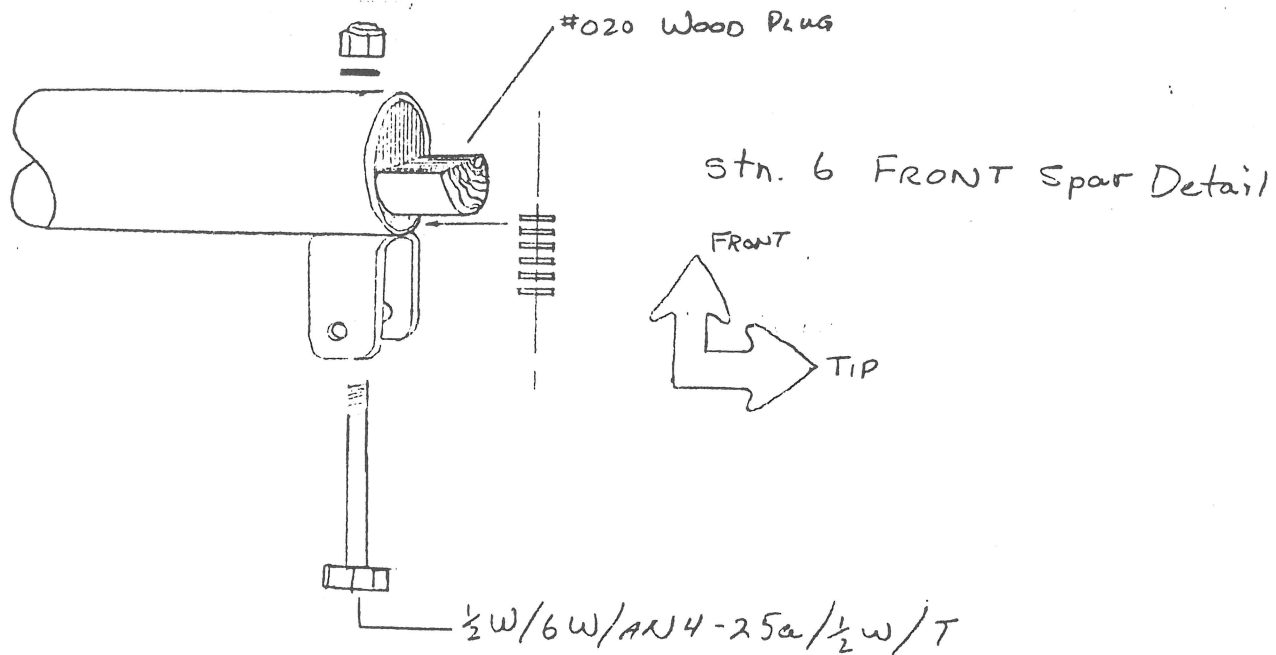
Tightening lower wire increases twist



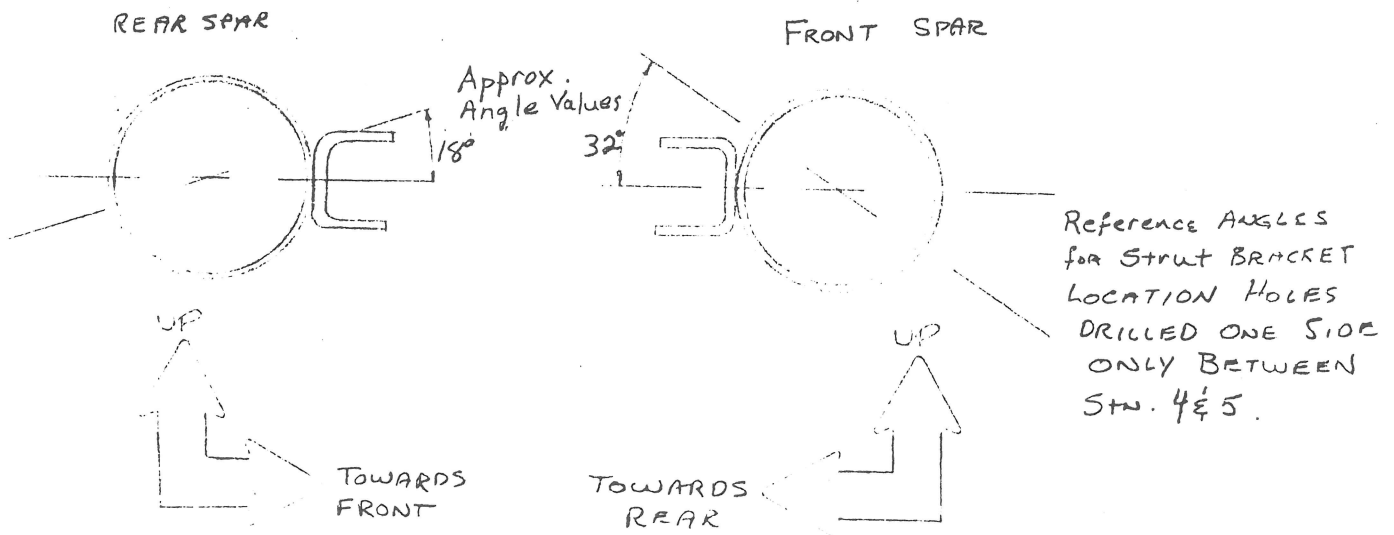
Method of safety wiring cable crossovers in each wire bay.



DWG 1:04



END VIEW OF FRONT & REAR WING SPAR IDENTIFICATION
LOOKING INWARDS FROM TIP ON RIGHT WING



SECT.B STEP #2: WING SPAR COMPLETION

Parts Requirements

Part No.	Description	Qty. Req'd.
Ø19-Ø1	Tip Tension Compression Strut	2
Ø19-Ø2	Tip Tension Compression Strut	2
956	Apex Plate at Compression Strut	4
979	Tip Compression Strut Stopper	2
2990	Front Side Strut Bracket	2
2991	Rear Side Strut Bracket	2
2992 L & R	Jury Strut Plate	1 ea.
2993 L & R	Jury Strut Plate	1 ea.

Bolt Requirements Qty.

AN3-15A	2
AN3-23A	2
AN3-24A	2
AN3-25A	2
AN3-26A	2
AN3-27A	2
AN4-15A	2

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
S -	12	1/2 W -	24
1/4"		1/4"	
S -	2	1/2 W -	4

Miscellaneous

	Qty.
3/16"x 1/4"grip SS rivet	10
3/16 x 3/8"grip SS rivet	10
3/16 x 1/2"grip SS rivet	8

SECT.B STEP #2: WING SPAR COMPLETION

Wing Strut Brackets (Detail 'A')

- 1.) Locate #2990 front wing strut bracket onto the L/E spar. There is a 3/16" locating hole between stn.4 & stn.5 drilled through one side of the tube only. Position the bracket so that the locating hole on spar aligns with hole on brkt. closest to straight side of brkt. The other two holes should be to outboard side of locating hole.
- 2.) Place a 3/16 bolt through brkt. and locating hole while clamping it into place with a C-clamp. The top of the brkt. should be flush to create a snug wrap around.
- 3.) Before drilling to set bolts and rivets measure the bracket location from the bolt center of the strut attachment to the hole center for the attachment point of the wing onto the fuselage. This should be 125±3/4" and the bracket must be pointed inwards towards the fuselage, as in Detail 'A' on dwg. #2:01.
- 3.) Now drill 3/16" dia. through the other side of the bracket to allow the 1/2W/AN3-27A/1/2W/S to be installed from the front. Drill #11 and set 3/16" x 1/2" grip s.s. rivets. (2 each side of brkt.)
- 4.) Locate #2991 wing strut brkt. at T/E as outlined in previous step with bracket angling down towards the center of the wing and rivet holes outboard of locating hole.
- 5.) You should measure 124" from rear spar attachment to wing strut attachment. Clamp into position.
- 6.) Drill 3/16" opposite locating hole and secure with 1/2W/AN3-25a/1/2W/S. Drill #11 and set 3/16" x 3/8" grip SS rivets. (4 req'd.)
- 7.) JURY STRUT PLATE INSTALLATION:
 - a) Position #2992 L & R jury plates (which have the lesser bend), onto the T/E between stn.2 & stn.3. Locate pl. using a 1/2W/AN3-24a/1/2W/S inserted from rear of spar. Use the hole on the pl. closest to the ninety degree corner. Plate should angle down towards center of wing with rivet hole parallel to spar and inboard of bolt hole. Tighten bolt then drill #11 and set 3/16" x 1/4" grip s.s. rivet.
 - b) Locate #2993 plates at L/E using 1/2W/AN3-26A/1/2W/S inserted from front of spar in the same manner as T/E. Check that pl. angles down towards center of wing with rivet hole inboard of bolt and parallel to spar. Drill #11 and set 3/16" x 3/8" grip SS rivet.

8.) RIB STOP INSTALLATION:

a) The rib stop is located on the top - rear side of the L/E. Its function is to create a wedge or base for the tip compression strut to butt against when installing the main sail.

b) Measure 24" from outboard edge of L/E and mark for reference. At this location make a mark 1/2" above a datum line spanning between the center of compression brkt's at stn.5 & 6.

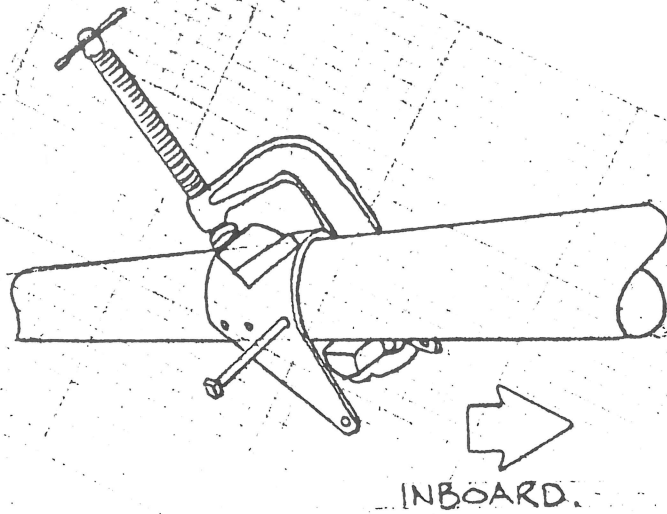
c) Drill 3/16" hole at this point (one side of tube only) for locating #979 rib stop plate. (see ref.dwg.#1:02 for proper position of pl.) Set pl. with 3/16"x 1/4" grip SS rivet on inboard end of pl. into locating hole. Align pl. parallel to spar then drill 3/16" through pl. and L/E for second rivet.

9.) WING TIP TENSION STRUT ASSEMBLY:

a) Assemble #019-01 to #019-02 using #956 apex plates as detailed in dwg.2:01. #019-01 should swivel freely between plates. Finger tighten the locking bolt (AN3-23A).

b) Put these parts aside until req'd in sail installation.

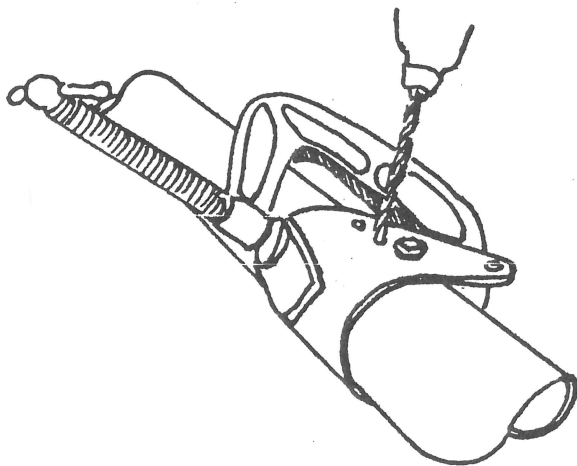
DWG 2:01



Locating Strut Bracket

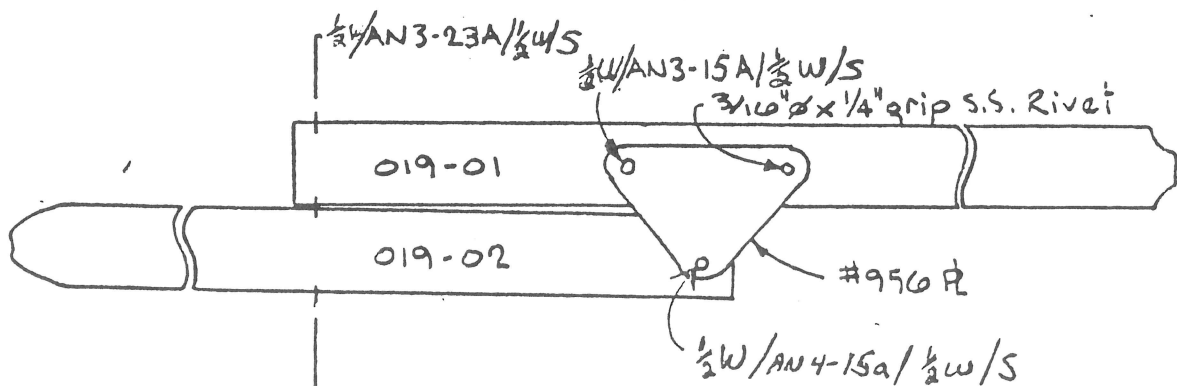
Clamp & Drill other side for bolt installation

Inboard Direction



Drilling rivet holes

After locating in place with 3/16" bolt through both sides.



SECT.B STEP #3: HORIZONTAL STABILIZER ASSEMBLY

Parts Requirements

Part No.	Description	Qty. Req'd.
2310	Horiz. Trailing Edge Tube	1
2311	Horiz. Leading Edge Tube	2
312	Keel Tube	1
313	Compression Tube	2
501	1-1/4" End Caps	2
517	7/8" Saddle	2
913	1/8" Nylon Washer	2
924	Plug Fitting	2
943	Incidence Spacer	1
953	Bracket	1
952	Apex Plate	4
983	Bracket	1

Bolt Requirements Qty.

AN3-12A	2
AN3-20A	1
AN4-21A	1
AN4-24A	1
AN43B-16A	2
AN43B-24A	2

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
S -	2	1/2 W -	4
T -	1	W -	2
1/4"		1/4"	
S -	4	1/2 W -	6
T -	2	W -	8

Miscellaneous

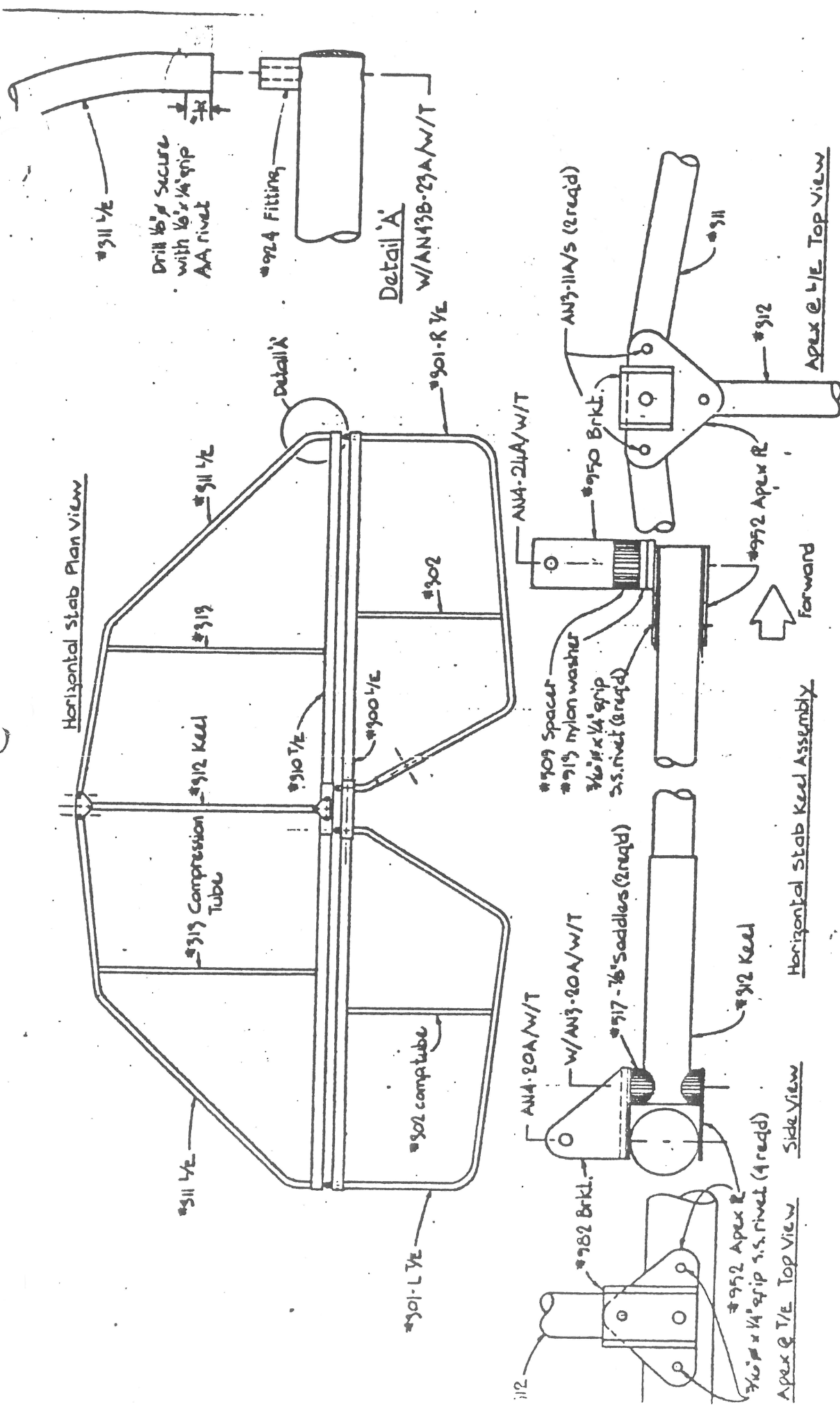
	Qty.
1/8"x 1/8" grip AA rivets	4
3/16"x 1/4" grip AA rivets	4
3/16"x 1/4" grip SS rivets	2

SECT.B STEP #3: HORIZONTAL STABILIZER ASSEMBLY

1. a) Determine forward side of #2310 horizontal stabilizer trailing edge by locating 1/2" dia. holes for compression struts each side of centre sleeve, and positioning the 1/2" holes forwards.
 b) Attach apex plates #952 to #2310 (top and bottom) with bracket #983 on top side. (see ref dwg. 3:01). Attach brkt. and pl's to centre hole by inserting W/AN4-21A/W/T through from top.
2. Attach plastic bushings #924 to forward side of trailing edge by inserting 1/2W/W/AN43B-24A/W/S (eye bolts) through rear of spar and through one bushing at each end of T/E spar. Tighten bolts being carefull not to crush trailing edge tube.
3. Attach Apex plate's #952 to front of keel tube #312 (end without sleeve) top and bottom as shown, with #953 bracket, #943 incidence spacer, and two #913 plastic washers. Use W/AN4-24A/W/T inserted from top. Secure rear hole of plates on top and bottom with 3/16" x 1/4" grip SS rivets.
4. Attach #312 keel to plate's at trailing edge using W/AN3-20A/W/T with two saddles #517 between plates and keel tube as shown. (#953 & 983 brackets should point up)
5. Attach leading edge tubes #2311 to forward apex plate. Use 1/2W/AN3-12A/1/2W/S inserted from top.
6. Insert #313 compression struts through 1/2" holes in T/E tube with nib of compression fitting protruding through 1/4" hole in rear side of tube. Align leading edge 1/4" dia. holes with nib ends of compression struts and insert leading edge over #924 bushings. Secure L/E to bushings by drilling 1/8" hole for 1/8" x 1/6" = 1/8" grip AA rivet (be carefull not to drill into eye bolt).
7. The nibs protruding through the trailing edge tube will require filing flush at this time. Use a coarse file and file nearly flush. With a finer file smooth out the edges so as to prevent chafing the sails.
8. Square the keel tube with trailing edge of horizontal stabilizer checking that Apex plate #952 is positioned squarely. Drill through existing holes of plate through trailing edge tube (one side at a time), securing with 3/16" x 1/4" grip AA rivet each time. Repeat top and bottom.
9. Secure eye bolts 1/2W/AN43B-16A/1/2W/S through rear of trailing edge each side of centre keel.

RX550-ASSEMBLY: STEP No.3

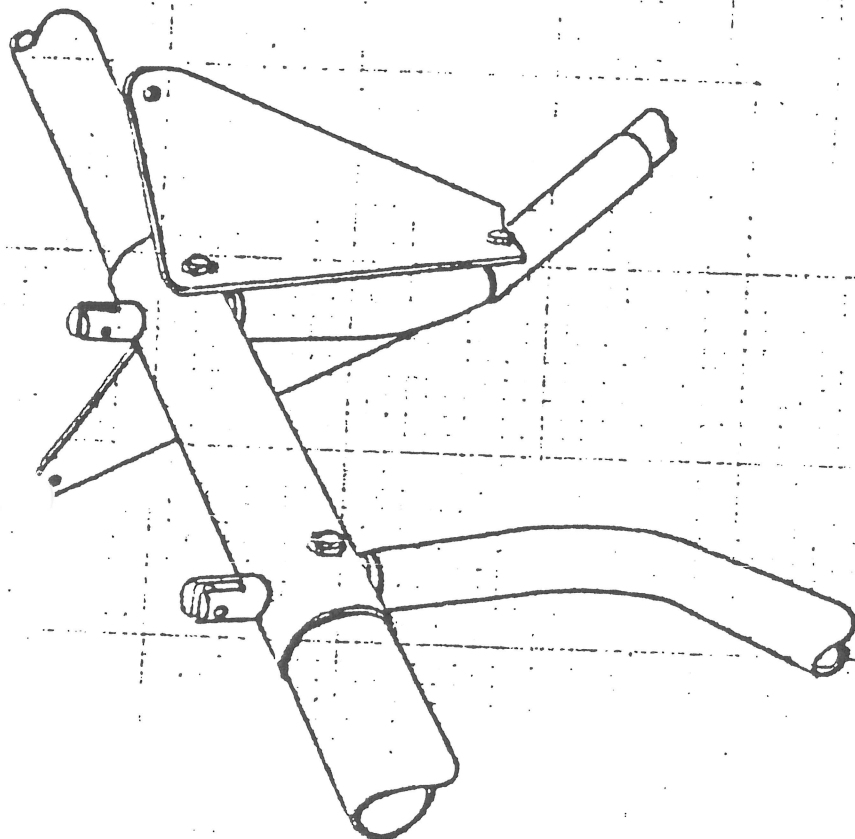
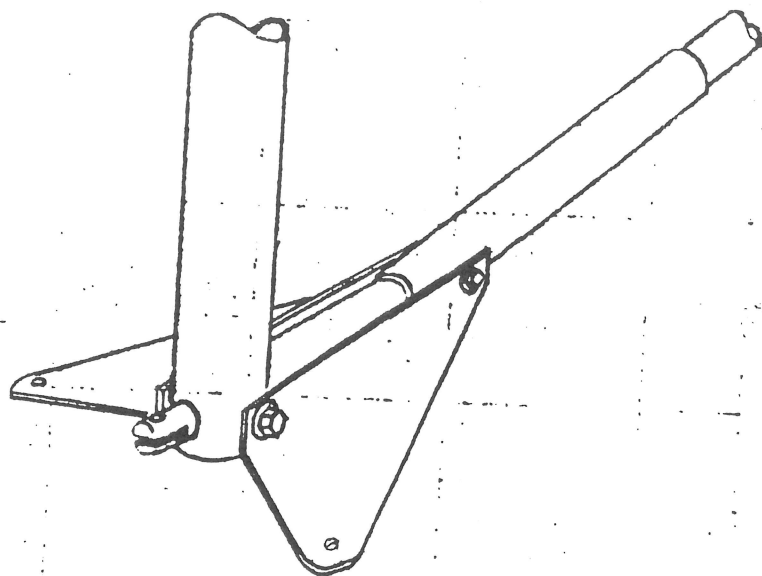
10. Install #501 end caps into each end of Horizontal Stab T/E tube. Drill 1/8" and secure end caps using 1/8"x 1/8" AA rivets (one req'd per cap).



Horizontal Stabilizer & Elevator		Dr By: H Durnic	900-101
		DWG: 3:01	

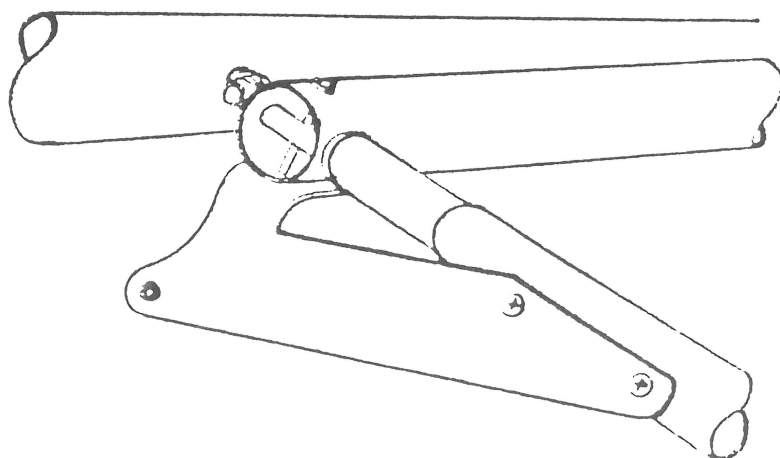
Control Surfaces
Horn Attachments

Rudder Horn Attachment



Elevator Horn Attachment
Note: Horns to Starboard
Bolt heads 'up'.

Aileron Horn Attachment
 $\frac{1}{2}$ Spar Shown for Ref.
(Right) Starboard Side



SECT.B STEP #4: ELEVATOR ASSEMBLY

Parts Requirements

Part No.	Description	Qty. Req'd.
300	Elevator Leading Edge	1
301-L	Elevator Trailing Edge	1
301-R	Elevator Trailing Edge	1
302	Compression Tubes	2
402	Horn	1
403	Horn	1
501	1-1/4" End Caps	2
902	Control Torque Fitting	2
903	Control Torque Fitting	2

Bolt Requirements Qty.

AN3-15A	3
AN3-16A	1
AN3-20A	1

Nuts	3/16"	Qty.	Washers	3/16"	Qty.
S		3	1/2 W		8
T		2	W		2

Miscellaneous Qty.

1/8"x 1/8" AA rivet	2
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SECT.B STEP #4: ELEVATOR ASSEMBLY

1. a) Identify the rear side of leading edge #300 by locating 1/2" holes for compression struts. The 1/4" holes face to the front.
- b) Push #903 control torque fittings through each end of leading edge from rear side. Align the 3/16" hole in the torque fitting with the one hole predrilled in #300 L/E and then drill 3/16" clean through both parts. Secure with 1/2W/AN3-15A/1/2W/S/ inserted from top, being careful not to flatten the tube.
- c) Push #902 control torque fitting through 1/2" holes at centre of leading edge from rear side. Again drill through both parts then secure left side only (port) with 1/2W/AN3-16A/1/2W/S inserted from top.
2. Position compression struts #302 into the leading edge tube so that the nib ends protrude through the forward side.
3. Properly place trailing edge tube #301-L (port side) and #301-R sleeved side (starboard) over torque fitting at end and centre of leading edge (refer to dwg. #3:01) and carefully plug nib end of compression strut into 1/4" hole in trailing edge. A little silicone spray or oil will help slide trailing edge onto fittings.
4. On trailing edge #301-R secure horn #402 (top side) and #403 (bottom) with 1/2W/AN3-20A/W/T through torque fitting. (finger tighten only). With a pencil, mark or scribe rear hole position of horn, onto center of trailing edge tube top and bottom. NOTE: Be sure that sleeve is all the way forward and is stationary while you are drilling. Once both sides are marked, centre punch the tubing as close to centre as possible on both sides. Now drill 3/16" through, one side at a time.
5. Insert 1/2W/AN3-15A/W/T through top horn, T/E tube and bottom horn. (finger tighten only).
6. Both bolts for horn attachments should be loose however all other bolts should be secure.
7. Insert #501 1-1/4" end caps into each end of elevator L/E then drill 1/8" and secure with 1/8"x 1/8" AA rivets.
8. File compression strut nibs flush as detailed in horizontal stabilizer assembly.

SECT.B STEP #5: AILERON ASSEMBLY

Parts Requirements

Part. No.	Description	Qty. Req'd.
201	Aileron Leading Edge	2
201-01	Nut Plate or Anchor Nut	2
202	Aileron Trailing Edge	2
203	Compression Strut	2
204	Compression Strut	2
205	Compression Strut	2
401-L	Aileron Horn	1
401-R	Aileron Horn	1
901	Control Torque Fitting	4

Bolt Requirements	Qty.	AN Hardware	Qty.
AN3-17A	2	AN509-10R20	4
AN3-20A	2	(countersink bolts)	

Nuts	3/16"	Qty.	Washers	3/16"	Qty.
S		6	1/2 W		14
T		2	W		2

Miscellaneous	Qty.
3/32"x 1/4" grip SS rivets	4

SECT.B STEP #5: AILERON ASSEMBLY

1. a) Determine rear side of #201 Aileron Leading Edge by locating 1/2" dia. holes for compression struts.

b) Slide #901 control torque fittings through each end of leading edge from rear. Align 3/16" hole predrilled on one side of L/E with center hole of torque fitting and drill clear through both parts.

c) Determine left and right ailerons at this point. Determine inboard side of leading edge by locating 1/4" dia. eyebolt hole 1 9/16" outboard of first compression strut. At inboard end of leading edge place 1/2W/AN3-20A/W/T, (finger tighten only). Note: bolts should be placed down from top side.

d) Secure outboard end of leading edge with 1/2W/AN3-17A/1/2W/S.

2. Place 1/4" dia. bolt (any) through 1/4" dia hole (just past #203 comp. strut stn.) from front of leading edge. Thread blind nut #201-01 onto bolt just enough to determine location. Drill two holes 3/32" through nut plate & leading edge, and secure with 3/32" x 1/4" s.s. rivets. (blind nut must be located on rear side of L/E).

3. Insert #203 compression strut into leading edge at inboard location (beside blind nut). #204 at mid stn. and #205 at outboard stn. Check that nib protrudes through 1/4" hole at L/E.

4. Lay trailing edge #202 along side and check that 1/4" dia. holes align with comp. struts. Press over torque fittings in leading edge and carefully pop nibs on comp. struts into appropriate holes in trailing edge. Use a little silicone spray on fittings.

5. a) Position Aileron horn 401-L for left aileron and 401-R for right at root end. Note: bolts should be inserted from top.

b) Finger tighten bolt and align 3/16" dia. countersunk holes on horn with centre of trailing edge. Be sure that sleeve is all the way forward, then centre punch each hole. Drill 3/16" dia. through the tube (try to align the drill straight through the tube). Deburr all holes then place AN509-10R20/1/2W/S (flush head bolts) through the horn and T/E. (finger tight only) Bolts remain loose until sail is installed.

SECT.B STEP No.6: RUDDER ASSEMBLY

Parts Requirements

Part No.	Description	Qty. Req'd.
250	Leading Edge	1
251	Trailing Edge	1
252	Compression Strut	1
402	Horn	1
403	Horn	1
501	1-1/4" End Cap	1
903	Control Torque Fittings	2

Bolt Requirements Qty.

AN3-15A	1
AN3-20A	1
AN3-14A	1

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
S	1	1/2 W	4
T	2	W	2

Miscellaneous	Qty
1/8"x 1/8" AA rivet	1

SECT.B STEP #6: RUDDER ASSEMBLY

1. a) Determine rear side of #250 Rudder Leading Edge by locating 1/2" hole for compression strut midway of the tube.

b) Slide #903 control torque fittings from rear side through L/E at each end. Drill clear through parts and secure top of rudder using 1/2W/AN3-15A/1/2W/S.

c) Attach horns #402 (port) & #403 (starboard), to bottom of rudder using W/AN3-20A/W/T (finger tighten only).

2. a) Insert #252 compression strut into L/E of rudder #250 with nib protruding through tube.

b) Lay the Trailing Edge tube #251 ready for insertion, checking hole alignment. (Compression strut is 28-1/8" from bottom of L/E). Slide T/E over torque fittings and press compression strut rib into 1/4" hole on trailing edge. A spurt of silicone spray or drop of oil on #903 fittings will help in sliding parts together. Be sure to file nib on comp. strut flush, before continuing.

3. a) Using horns as template mark or scribe center of 3/16" hole position of horn onto trailing edge tube. Be sure that 7/8" sleeve is fully forward, and that it is stationary while you are marking.

b) Once both sides are marked, center-punch the tubing as close as possible to the tube center on each side. Now drill 3/16" through the sleeve and trailing edge, one side at a time.

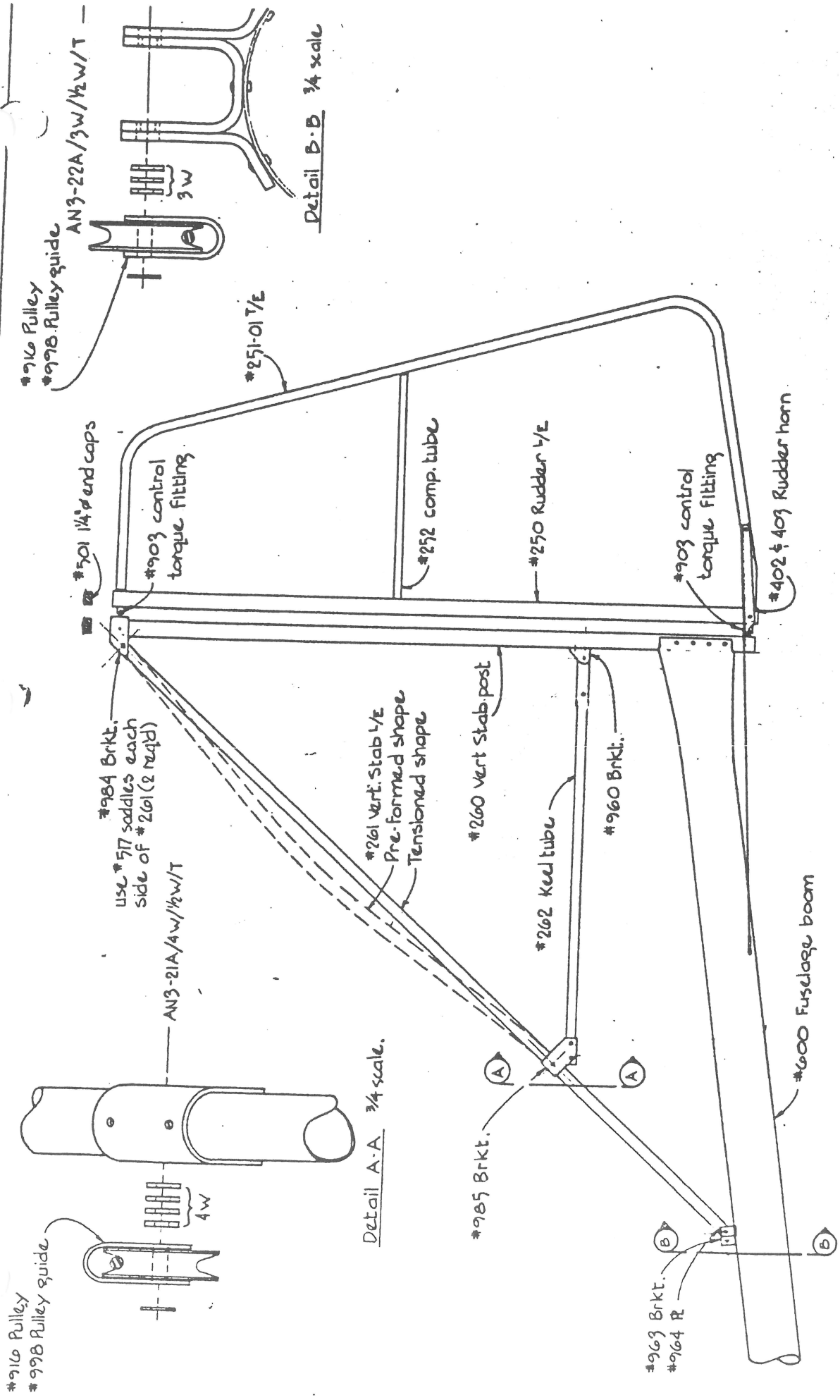
Note: To ensure a drill hole through the center of the tube, you may like to use this technique. Take a piece of paper an inch or so wide and long enough to wrap around the circumference of the tube. Wrap this paper around the tube and mark where the paper meets. Now fold the paper in half between the edge of the paper and mark. You now have 1/2 the circumference of the tube for locating the opposite hole.

4. Drop a W/ AN3-14A/W/T through horn-trailing-edge-horn and finger tighten.

5. Now you may tighten the top bolt being careful not to squeeze the leading edge tube. Leave the horn bolts loose until covering is complete.

6. Install #501 1-1/4" end cap into top end of rudder L/E then drill 1/8" and secure with 1/8"x 1/8" AA rivet.

7. File compression strut nibs flush as detailed previously.



Vert. Stab & Rudder Assembly

Dr. by: M. Dennis

DWG: 6:01

200-101

SECT.B STEP #7: CONTROL SURFACE COVERINGS

Parts Requirements

Part No.	Description	Qty. Req'd
206 L&R	aileron cover	lea.
253	rudder cover	1
303 L&R	elevator cover	lea.
316 L&R	horizontal stab.cover	lea.
317	cover tension tube	2

AN Hardware	Qty.
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AN43B-16A (eye bolt)	2
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Miscellaneous	Qty.
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1/8" pull string	5 ft.
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1.) RUDDER

a) Be sure the horns have been drilled for installation at the bottom. Slide the cover on, keeping the seam folded over consistently to one side. Be carefull of the torque fittings and bolts. Work the cover along by pulling on the fabric while being carefull not to bend the T/E.

b) Once the fabric is taught throughout, run the string through the loops provided at the bottom front and rear to help pull the two sides together.

c) When the slack has all been taken up at the top of the rudder and there is not another millimeter to go on, stand the rudder upside down and overlap the velcro. It helps to start in the middle and bow the central part of the tube to work the velcro 'loops' under the 'hooks' with your thumbs and fingers. At this point be carefull not to rotate the sleeve on the T/E, missaligning the holes set for the horns. With the mid point of the velcro fully overlapping, work to the front and rear.

d) Use the horns to help locate position to burn or cut holes in sail for re-inserting the horn attachment bolts in T/E.

e) Re-install horn bolts and tighten.

2.) HORIZONTAL STAB

a) Determine the left and right side of the stabilizer as there is a left and right covering. Brackets are positioned on the topside of the horizontal stab.

b) The top side of the coverings have a flap with velcro on it and a small rib pocket. Insert #317 tension tubes (1/4"x26" tube) into the pockets, one each side.

c) Slide the covers on their proper sides. Work the fabric on with your hands, then, thread the pull string through the webbing loops at the front and back, in a double purchase, to pull the two halves together. Alternate the front then the rear and work it some more with your hands.

d) When the slack is out of the tips and little or no more fabric will go on, loop the strings through the slits around the tension tubes which were inserted earlier. Cross the string back and forth pulling tension on the sail as you work towards the opposite end. Tie off with 3 or 4 half hitches and trim the excess string.

e) Once you are satisfied with the installation, cut or burn holes at the 3/16" hole locations on leading edge and trailing edge, where the eye bolts go through for strut attachment later.

3.) ELEVATOR

a) The right side of the elevator frame has the reinforcement tube for the horn attachment. Check to make sure that the horn location has been pre-drilled for horn installation.

b) The elevator covers are meant to have the velcro flap point down when installed, so check that the right side is installed to the horn side.

c) Slide the cover on, working it by hand to start with. Be careful not to pull down too hard, which may bend the leading edge. The final tensioning comes from the webbing loops on the leading edge ties.

d) At the leading edge, tie the left and right side together in a double purchase, and go around one side of the hinge point fittings to pull around.

e) Pull independently, each of the trailing edge loops, being careful not to fail the fabric from over tensioning. Close the velcro up similarly to the rudder.

f) Burn or cut the holes through the fabric where the horn bolt is to go through, and tighten all horn bolts.

4.) AILERON COVERING

a) Before installing the aileron covers, check that the nut plate is installed on the inside of the aileron near the longest compression strut, and the horn has been positioned with all holes pre-drilled.

b) To put the cover on, the counter sunk horn bolts must be removed. The left and right ailerons are designated only by the method of assembly. All bolts should be inserted from the top, blind nut is inboard of center, and horns are located on bottom side.

c) The aileron covers slip on so that the velcro flap is on the top surface, and then wraps around to join at the bottom. Slide the fabric over the frame while keeping the seam folded consistently over to one side. NOTE: With the sail loosely fitted onto the frame, gather the sail at the tip and poke the torque fitting through the end opening. This is to prevent tearing the cover.

d) With the cover on most of the way, and the torque fitting clear of the sail, stand the aileron vertical and work the fabric by pulling down on each side. Check that the seam is neatly folded to one side of the tube. It's easiest to start pulling from the very tip standing on a chair and work it downwards in several passes.

e) Run the string through the webbing loops at the velcro end, and tension as much as possible, being careful not to actually fail the fabric. Tie off the loops with a couple 1/2 hitches and wrap the velcro flap around the T/E to fasten onto the bottom surface. Pull taught on the cover to set the velcro in place.

f) Locate and burn the two holes for horn installation reinstalling the MS509-10R20/1/2W/S by lifting the velcro flap for access. Tighten all horn bolts.

g) Locate the 1/4" hole on the L/E (in front of the blind nut) and burn or cut an access hole in the fabric. Turn the AN43B-16A eyebolt into the blind nut but be careful not to squash the tube. Once all of the bolt is in, a maximum of 1/2 turn is required for tightness.

SECT.B STEP #8: LOWER FUSELAGE ASSEMBLY

Parts Requirements

Part No.	Description	Qty. Req'd
2600	Fuselage Tube (Fuse Tube)	1
2601	Web Plate	1
2609	Side Strut X-Bar	1
2613 L&R	Yaw Struts	lea.
2702	Landing Gear X-Bar	1
953	1" 'U' Bracket	4
973 L&R	Landing Gear Plates Front	lea.
974 L&R	Landing Gear Plates Rear	lea.
2975 L&R	Side Strut Plate, Front	lea.
2976 L&R	Side Strut Plate, Rear	lea.

Bolt Requirements

Qty.

AN4-15A	2
AN4-16A	2
AN4-21A	4
AN4-25A	2
AN4-30A	2

Nuts	Qty.
1/4"	

S	6
T	6

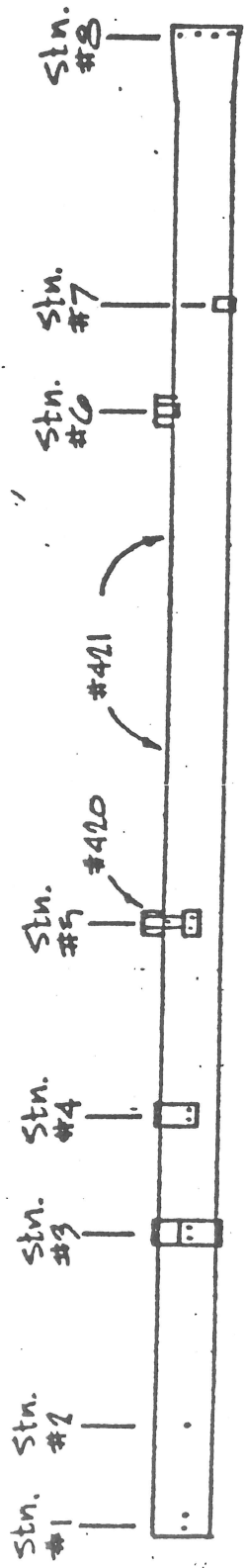
Washers	Qty.
1/4"	

1/2 W -	8
W	14
FW	2

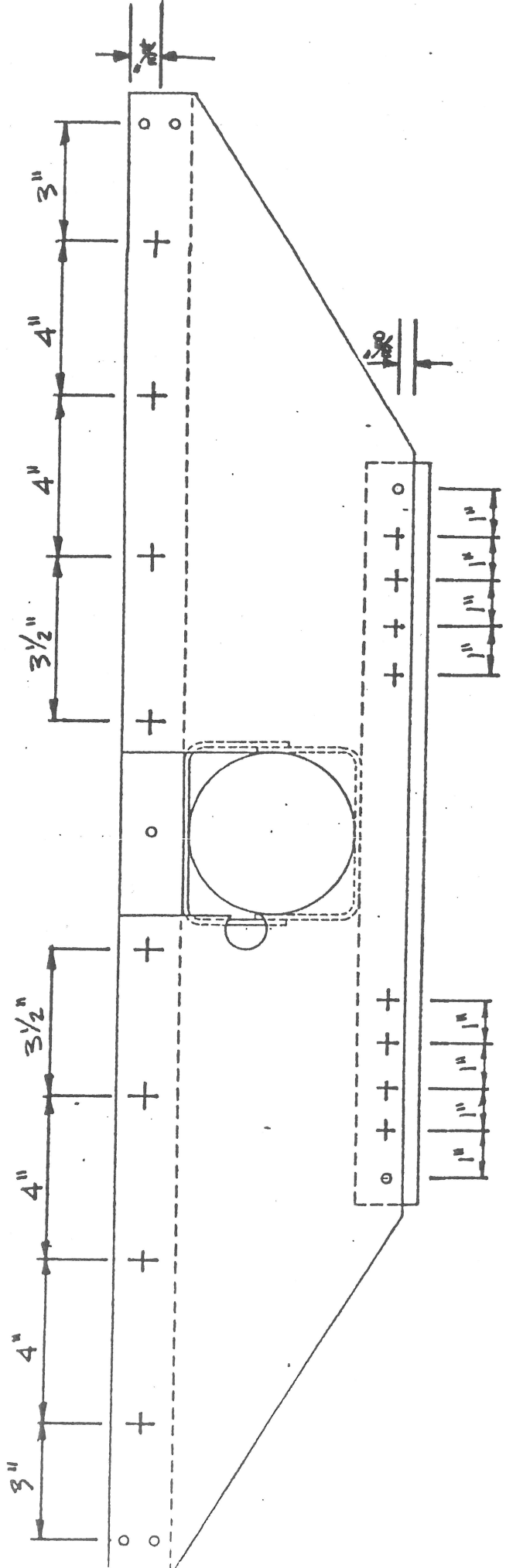
Miscellaneous

Qty.

3/16"x 1/4" grip SS rivets	16
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FORWARD. 2600 Fuselage Tube



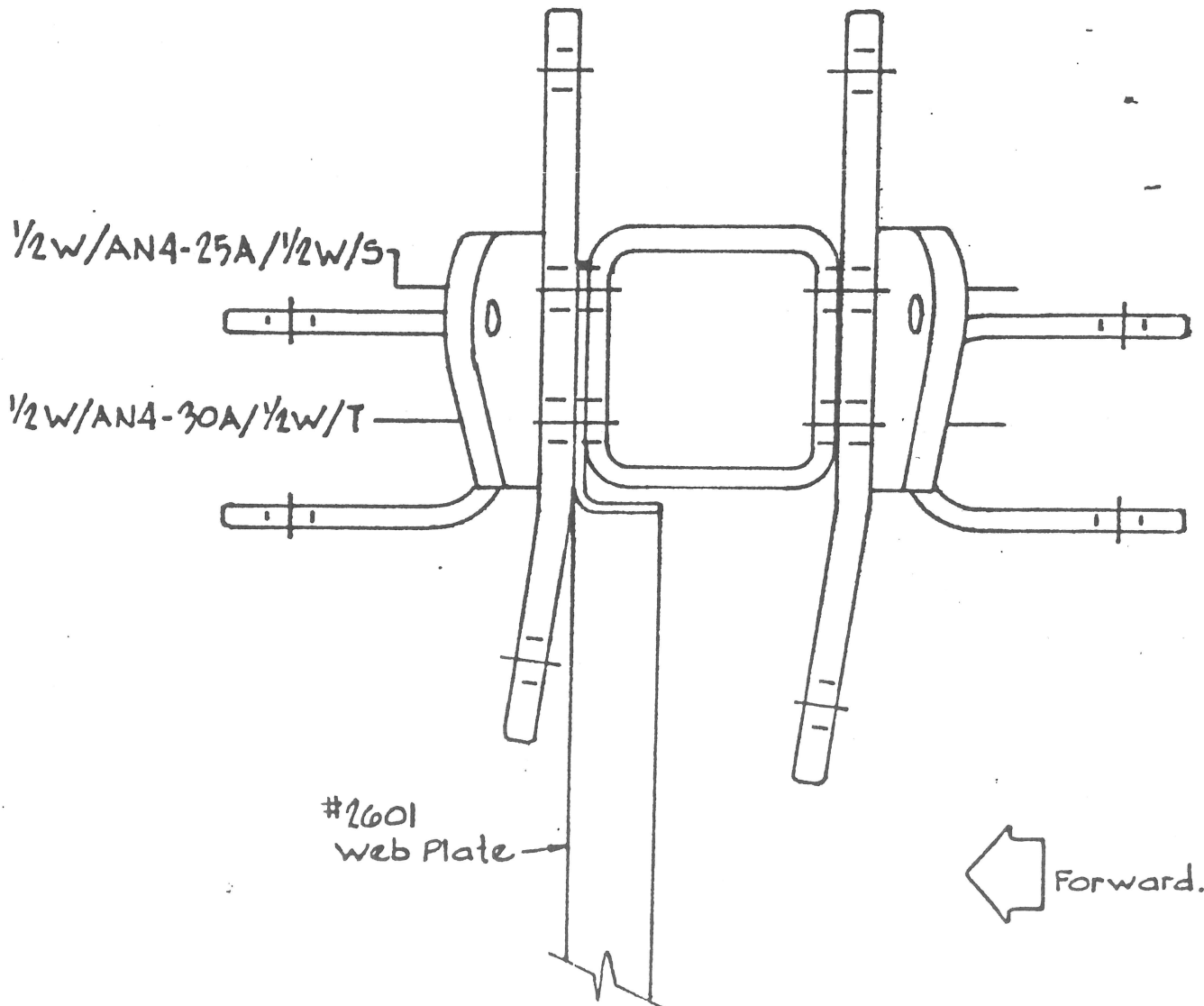
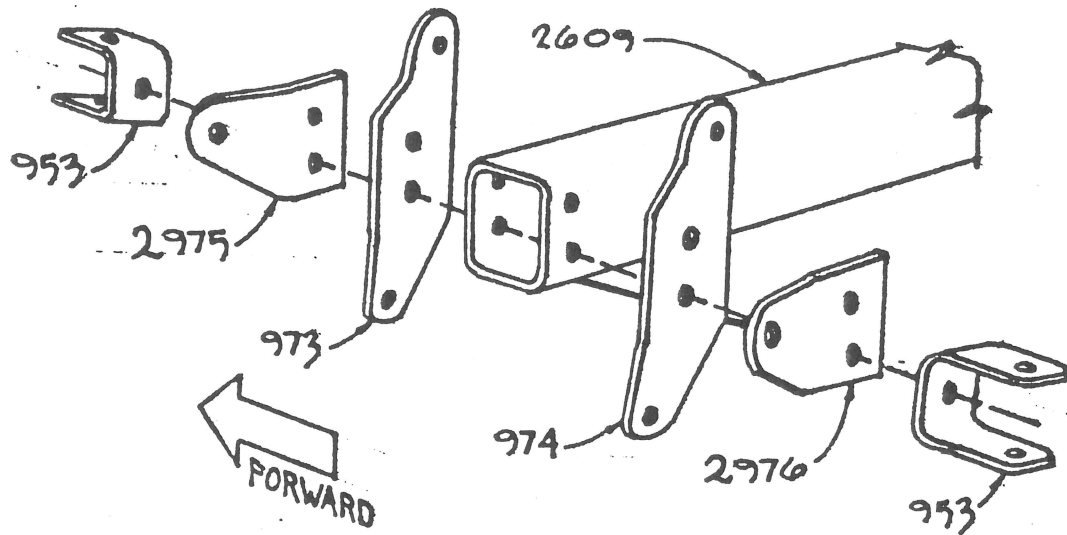
#2601 Web Plate Drill 3/16" all holes

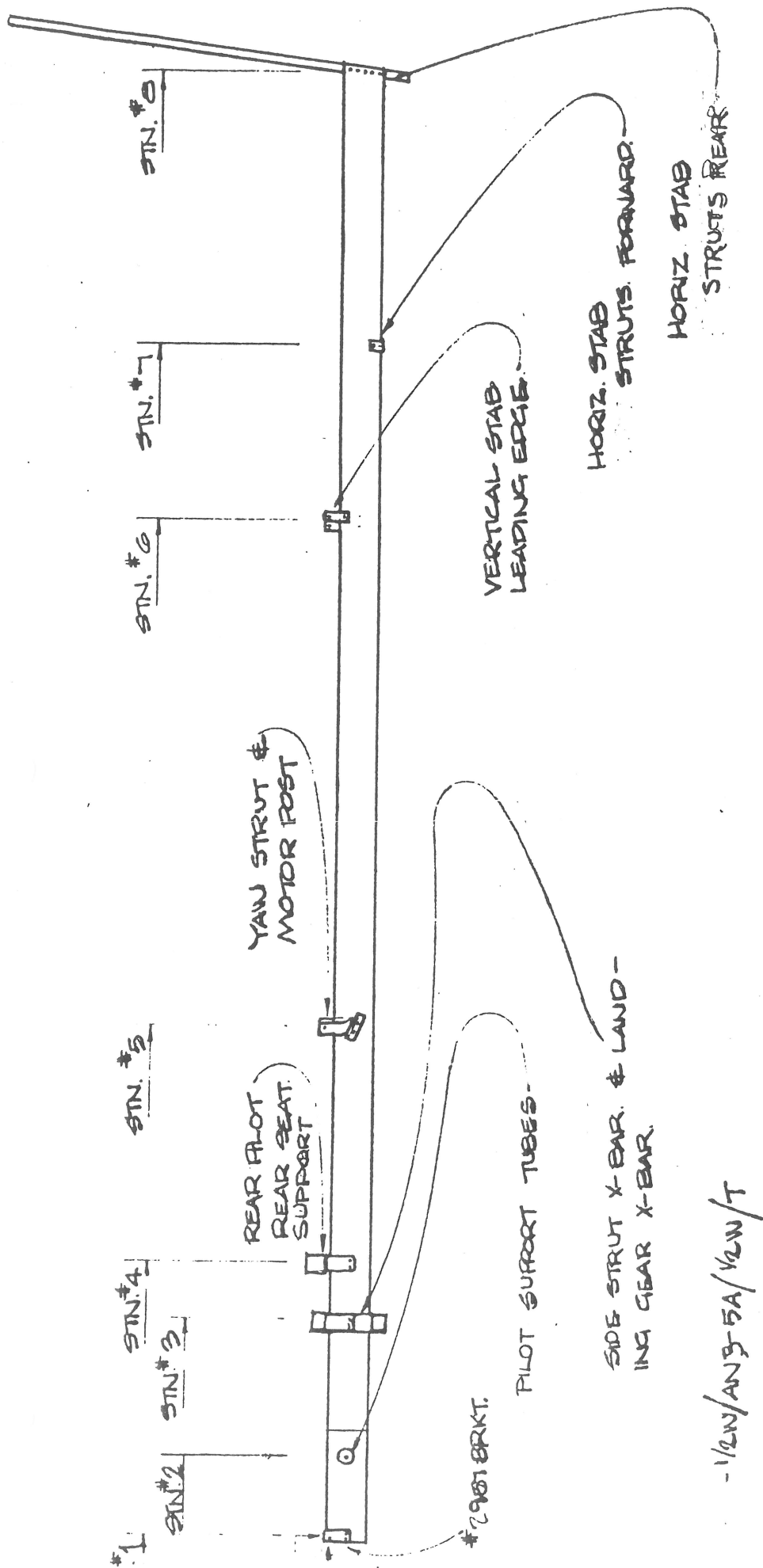
DWG. 8:01

SECT.B STEP #8: LOWER FUSELAGE ASSEMBLY

- 1.) Refer to dwg.8:01 for ref.Pad the rear of fuse tube to keep from scratching it. At stn.No.3 position the side strut X-Bar #2609 to the top side of the preinstalled brkt.Secure, using FW/AN4-21A/W/T inserted from the top.
- 2.) At Stn.No.3 install the landing gear X-Bar #2702 to the bottom brkt.securing with W/AN4-21A/W/T. inserted from bottom.
- 3.) Refer to dwg.8:01. Pre drill the web plate #2601 using a 1/8" drill at appropriate spacings, top and bottom.
- 4.) Locate the web plate onto the fuse tube , with the 'lip' or bent edge facing the rear, in front of the side strut X-Bar and L/G X-bar at stn.No.3.Allow the elevator cables to run through the cut-out in the web pl.(starboard side).
- 5.) Clamp the web pl. in position,carefully aligning the top and bottom edges square with each X-bar and flush at the top edge. Drill #11 through the trace holes into the side strut X-bar,for rivets. Work from each end towards the center,securing each time with 3/16"x 1/4"grip SS rivets.
- 6.) Repeat procedure for the L/G X-bar at bottom.
- 7.) Once all rivets are set,(CAREFULLY) run a 1/4" drill, from the rear side,through the two holes at each end of the 'S/S' X-bar and through the web pl. Drill out the bottom holes, each end of the L/G X-bar using a 5/16" drill.
- 8.) a) Install the #973 R&L and 974 R&L landing gear plates and the 2975 R&L and 2976 R&L wing strut plates, as shown in dwg.8:02, to each end of the S/S X-bar. All of these plates have a left and right, and fore and aft, so check that you are installing them properly.
 b) Install the top bolt first using 1/2W/AN4-25A/1/2W/S, inserted from the front. Pre-tighten this bolt (one each side) before continuing.
 c) Install #953 brkt.'s to the front and rear, at each end of X-bar.Use 1/2W/AN4-30A/1/2W/T inserted from front.NOTE position of brkt's.
- 9.) a) Install the yaw struts #2613 Left & Right (beveled end) to stn.No.5 at fuse using W/AN4-16A/W/S.
 b) Attach the opposite end to the #953 bkt's each end of the X-bar using W/AN4-15A/W/S inserted from the top. Tighten to lightly oval the yaw struts (about 24-30 in. lbs. of torque).

DWG; 8:02





DWG. 8:02.

SECT.B STEP #9:

FRONT PILOT SUPPORT MOUNTING ON FUSELAGE

Part No.	Description	Qty. Req'd.
505	S.S. Tang	2
2603	Pilot Support Tubes	2
2627	Rear Pilot Foot Support Tube	1
2935	1/4" hole x 1/4" Thick washer	2
966	Control Mount Plate	1
968 L&R	Angle Bracket	lea.
957	4" Fuse brkt. Stn.#1	1

Bolt Requirements Qty.

AN3-5A	4
AN4-20A	2
AN4-22A	6
AN4-27A	2

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
T 7	4	W 7	8
1/4"		1/4"	
T 7	10	W 7	20

Miscellaneous Qty.

3/16"x 1/4" grip SS rivet	2
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STEP #9:

FRONT PILOT SUPPORT MOUNTING ON FUSELAGE INSTALLATION;

1.) a) Position #957 (4" brkt.) on fuse tube at stn.No.1, with 1/4" hole on brkt., in forward most position.

b) Insert W/AN3-5A/W/T (4 req'd) through from inside of fuse tube with washer and nut on outside of brkt. Finger tighten only.

c) Secure top of brkt. with 3/16"x 1/4" SS rivets, then tighten all bolts.

2.) a) Insert W/AN4-22A/W/T through from inside of fuse tube at Stn.#2 (one each side). Place #2935 aluminum spacer over bolts, then position #2603 pilot support tubes (one each side), use aft hole over bolt (see ref.dwg.9:01), place washer/nut and finger tighten.

b) Place the #968 Angle Bracket (see dwg.9:01 Detail 'A') onto the tube, using W/AN4-20A/W/T which goes down through the tube vertically. FINGER TIGHTEN ONLY!

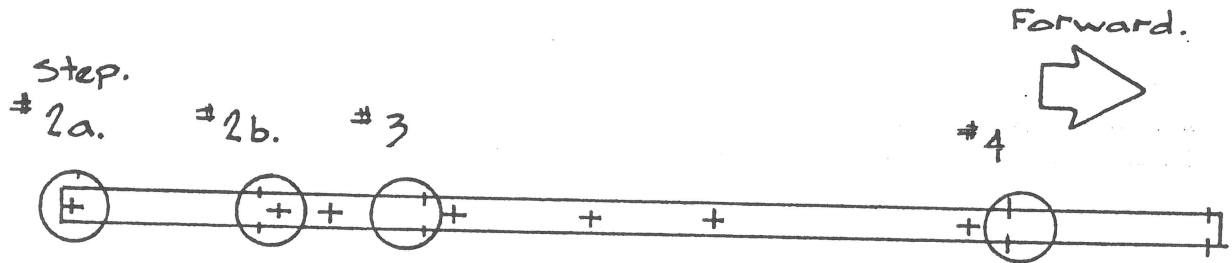
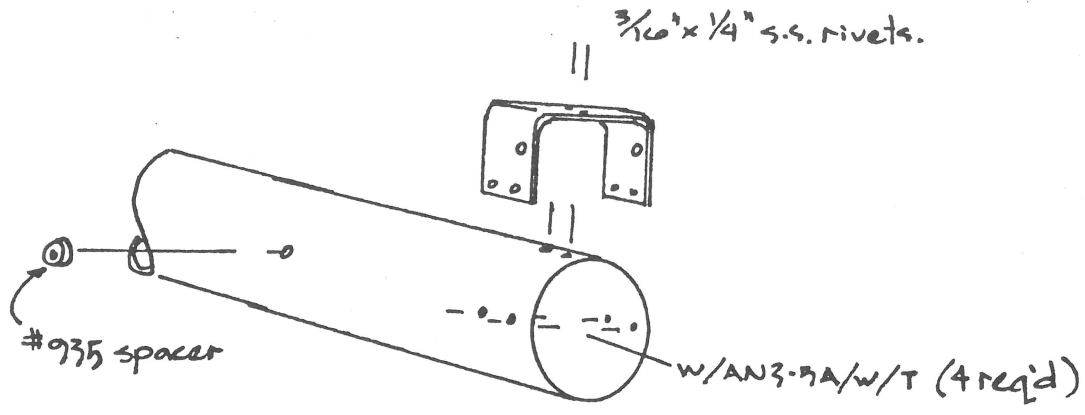
c) Insert W/AN4-21A/W/T, with #505 s.s.tang on the outside, through support tube and angle brkt.

d) Swing the tube into position and push the bolt through the 1/4" hole in the bracket at Stn.1. Tighten all bolts.

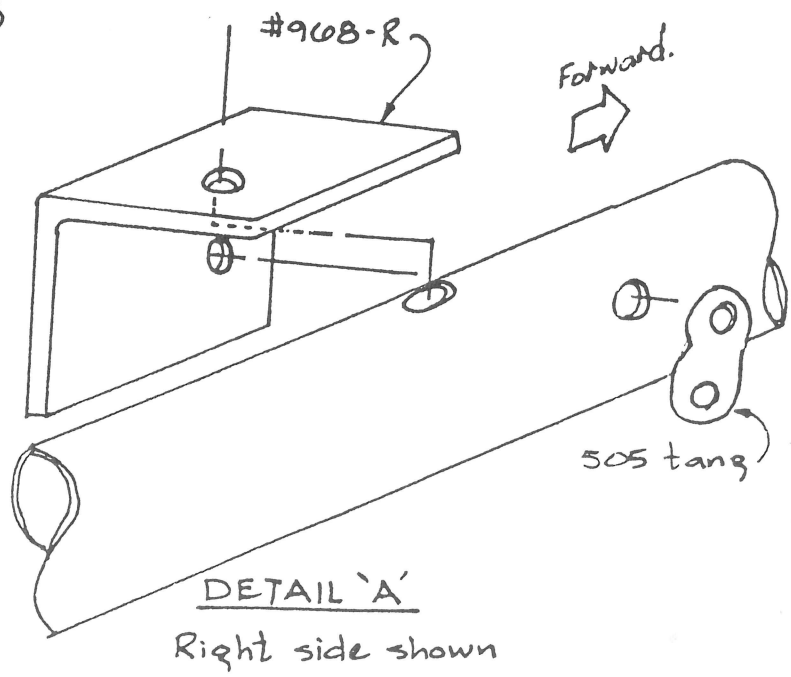
3.) Install the #2627 rear pedal X-tube under the support tubes just in front of the fuselage. NOTE: Outboard holes in X-tube are drilled at an angle (top hole favors forward side when installed). Use W/AN4-27A/W/T inserted down through support tube and X-tube.

4.) Install #966 mount plate to underside of support tube, with 1/4" hole in center of pl. to the rear. Insert W/AN4-22A/W/T from the top. (2 req'd)

NOTE: The front fork compression tubes will be attached to these bolts in a later section, however the plate must be affixed tight for torque arm assembly. Use several washers under the nut for temporary installation.



Side View #2603



STEP #10:

FRONT FOOT PEDAL SUB-ASSEMBLY & INSTALLATION

Parts requirements

Part no.	Description	Qty. Req'd
2626	Front Foot Pedal X- T Tube	1
2629-01	Top Plate	1
2629-02	Bottom	1
953	Bracket (1")	2
982	No Twist Brkt.	2

Bolt Requirements	Qty.	AN Hardware	Qty.
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AN4-21A	2
AN4-22A	4

Nuts	Qty.	Washers	Qty.
1/4"		1/4"	
T -	6	W -	12

Miscellaneous	Qty.
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3/16"x 1/4" grip SS	4
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STEP #10:

FRONT FOOT PEDAL SUB-ASSEMBLY

1.) Assemble front foot pedal plates and X-tube prior to installation.

a) Install W/AN4-22A/W/T through #953 bracket, one each side, through the forward end-holes of the top support plate #2629-01 (rear side of plate is identified by two 3/16" holes).

b) Place plate over #2626 foot pedal X-tube and push bolts through end holes of tube. Position bottom pl. #2629-02 under X-tube and tighten bolts each end.

c) Lightly drill the two center-forward holes for bolt clearance and insert W/AN4-22A/W/T through from top. Attach #982 bracket to bottom side with 3/16" rivet hole to forward position.

d) Square bracket to assembly and drill #11 through existing hole in brkt. and bottom pl. Secure both with 3/16"x 1/4" grip SS rivet.

2) Install the assembly to the front of the pilot support tubes securing with W/AN4-21A/W/T inserted through the center rear holes of the support plate, and forward hole in support tubes.

3) Drill #11, through the rear two holes in the top plate, into the top side of the pilot support tubes and install 3/16"x 1/4" grip SS rivets.

SECT.B STEP #11: MAIN GEAR INSTALLATION

Parts Requirements

Part No.	Description	Qty. Req'd
505	S.S. Tangs	2
2704 L&R	Main Axle Tube	lea.
2705 L&R	Landing Gear Drag Struts	lea.
2712	Main Wheels	2
716	Shock Absorbers	2
913	1/8" Thick Nylon Washer	2
977	Axle Plates	4

Bolt Requirements	Qty.	AN Hardware	Qty.
AN3#15A	2	MS24665#357	4
AN4#6A	4	(1/8"x 1 1/2" cotter pin, incl. 2 spare)	
AN4#16A	2		
AN4#17A	2		
AN4#22A	2		
AN5#24A	2		

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
S 3/16"	2	1/2 W 3/16"	4
S 1/4"	4	1/2 W 1/4"	20
T 1/4"	6	5/16"	
T 5/16"	2	W 5/16"	2
		FW 5/16"	2

Miscellaneous	Qty.
3/4" retainer washer	4
3/4" shim washers	4

STEP #11: MAIN GEAR INSTALLATION

1.) Attach # 977 axle plates to #2704 Right & Left axle tubes in the direction shown in dwg.10:01. Put a 1/2W/AN4-17A/1/2W/T through #505 s.s. tang, inserted from front and snug the bolt up tight (50 in. lbs.) Once the 1/4" bolt is through you may need to trace drill the 3/16" hole lightly to push through 1/2W/AN3-15A/1/2W/S inserted from front.

2.) Attach the 2704 L&R axle tubes to the L/G X-bar on fuselage with a FW/AN5-24A/W/T, inserted from front, with a #913 1/8"th. plastic washer between the axle tube and the 1-1/2" sq. tube, keep in mind there is a left and right. The axle plates should point up to the downtube plates. Leave the 5/16" nut finger tight for seat belt attachment.

3.) Install the #716 shock absorbers using a 1/2W/AN4-16A/1/2W/S on the bottom and a 1/2W/AN4-22A/1/2W/S on the top. Insert each from front.

4.) Install the 2705 L&R landing gear drag struts to the tangs at the fuse tube str.1, and axle tube, using 1/2W/AN4-6A/1/2W/T on each end. Put a tight torque on these bolts, (50 in. lbs.) as they come across high single shear loads from time to time.

NOTE: Now is the time if you have brakes to be installing them. Use the installation instructions for accessories.

5.) a) Before putting the wheel on, pre-grease the roller bearings by dabbing bearing grease into the inside of the wheel. The bushings should have a light greasing on them also. Install wheels with air valve out.

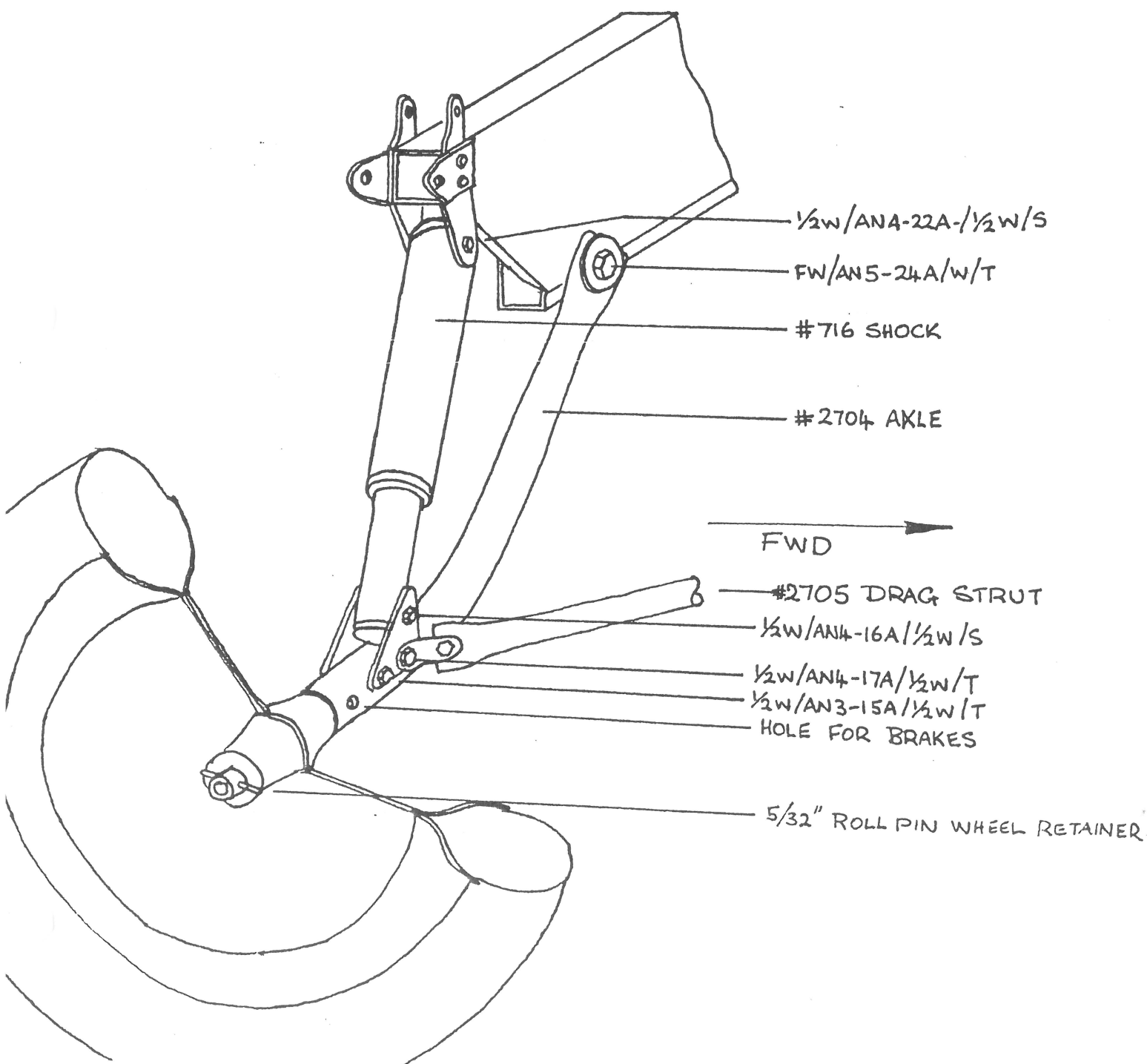
b) Place axle washer to each side of wheel and secure with AN392-41 clevis pin and AN380-2-2 cotter pin. NOTE: The wheel bearing housing can vary in dimension, and therefore a thinner shim washer is provided to allow a snug fit. (place to outside).

c) During preflight of aircraft, check the retaining pin and the wheel bearing for wear.

Rx-550

DRAWING 11:01

MAIN GEAR INSTALLATION RIGHT SIDE SHOWN



SECT.B STEP #12: VERTICAL STAB. ASSEMBLY

Parts Requirements

Part No.	Description	Qty. Req'd
2260	Tail post	1
2261	Vertical Stab. Leading Edge	1
262	Vertical Stab. Keel	1
263	Vertical Stab. Sail	1
501	1 1/4" End Cap	1
517	7/8" Saddles	2
914	Brass Bushings	2
916	Pulley	2
2939	Tail Wheel Bushings	2
960	Bracket	1
984	Vertical Stab. Top Bracket	1
985	Vertical Stab. Leading Edge Brkt.	1
998	Pulley Guide	2

Bolt Requirements	Qty.	AN Hardware	Qty.
AN3-13A	1	AN43B-16A	1
AN3-16A	5	AN43B-20A	1
AN3-22A	2	(eye bolt)	
AN4-15A	2		
AN4-17A	1		

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
S "	1	1/2 W "	6
T "	7	W "	17
1/4"		1/4"	
S "	3	1/2 W "	9
T "	2	W "	2

Miscellaneous	Qty.
3/16" x 1/4" grip SS rivet	1
1/8" x 1/4" grip SS rivet	4
1/8" x 1/8" grip AA rivet	1

STEP #12: VERTICAL STAB ASSEMBLY

1.) Vertical Tail Post mounting to fuselage:

a) Using two C-clamps and wood blocks, lightly squeeze the rear of the fuse tube. NOTE: position blocks so that 3/16" holes are not covered.

b) Slide #2260 tail post into 1-1/4" hole from top, and align two or more holes. Clamp the tube tight, watching for proper alignment of holes, and push through W/AN3-16A/W/T into each of the holes, gradually tightening each bolt.

NOTE: All holes are factory drilled for proper alignment and should not require re-drilling. A 3/16" reaming bit can be used for hole clearance if required.

Check at this point for trueness of the Tail Post. The post should be square to the side strut X-bar, within 1.5 to 2 degrees. If you find that the post leans excessively to one side, it will have to be removed. DO NOT RE-DRILL HOLES IN FUSE TUBE! A round file will be required to file out the top and bottom edges of the 1-1/4" hole in the fuselage, to favor an opposite direction of lean. Shimming with washers between the inside wall of the fuse tube and the tail post may also be necessary however extremely unlikely.

2.) a. Attach #984 bracket to tail post #2260 at top, (See dwg 12:01) using 1/2W/AN43B-16A/1/2W/T inserted from rear.

b. Check that bracket is flush with tail post and drill #30 or 1/8" dia. at each side of bracket securing with 1/8" dia. x 1/4" grip s.s. rivet each side.

c. Attach #960 bracket to vertical tail post with angle upwards. Use W/AN3-16A/W/T through lower hole on bracket inserted from front.

d. Align #960 bracket on tail post so that secondary hole is directly above bolt. Drill #11 and secure with 3/16"x 1/4" grip SS rivet.

3.) a) Assemble #985 bracket, to vertical stabilizer L/E #2261 (note the direction of bend in L/E in relation to bracket). The bend in the L/E is req'd to pre-stress the sail covering, which in turn will straighten the tube. Fasten bracket to L/E at the 3/16" dia. hole using 1/2W/AN3-22A/4W/1/2W/T. Finger tighten only.

NOTE: #985 bracket wraps around L/E and 3/16" dia. bolt MUST pass through from left (port) to right (starboard) for pulley assembly.

b) Check that bracket is flush with L/E and drill #30 or 1/8" dia. on front side of bracket securing with 1/8" x 1/4" grip s.s. rivets.

4.) a) Attach #262 keel tube to 3/16" dia. hole at bracket #985 with 1/2W/AN3-13A/1/2W/S. Top corner of tube should be chamfered to allow close fit against L/E tube.

b) Install #2261 L/E onto rear hole of brkt. on fuse tube at stn.No.6 with 1/2W/AN4-17A/1/2W/S inserted from starboard side. (fuse tube end of L/E is identified by 1"sleeve.)

5.) Wash hands. Slide sail, simultaneously over tail post on fuselage and vert.stab L/E. Secure L/E to brkt. at top of tail post with 1/2W/AN4-15A/1/2W/S Note: use #517 saddle each side of L/E between brkt.

6.) a) The keel tube must be pulled down into position. Run a string through the sail opening for the vertical tail post and over the keel tube, then back down and tie each end together under the fuse tube. Stand in the loop under the fuse tube and pull the keel down, then insert 1/2W/AN4-15A/1/2W/S.

b) Hot knife one hole (approx. 3-1/2" in front of the tail post) on the keel tube, for the horizontal stabilizer attachment point.

7.) Pulley Installation:

a) Insert 1/2W/AN3-22A/3W/1/2W/T through brkt at stn.No.6 on fuselage from port to starboard (L#R).

b) Insert #914 brass pulley bushing into #916 1-1/2" dia. nylon pulley. Pulley rotates around bushing, CHECK for freeness of rotation. If pulley is stiff to turn you will be required to drill out pulley with letter 'O' or 'P' drill (8.2mm). A small amount of silicone spray will help.

c) Determine UP elevator cable (see ref.dwg.12:02). Place cable under pulley with #998 pulley guide around pulley and over the cable.

d) Place pulley and cable over bolt at stn.6.

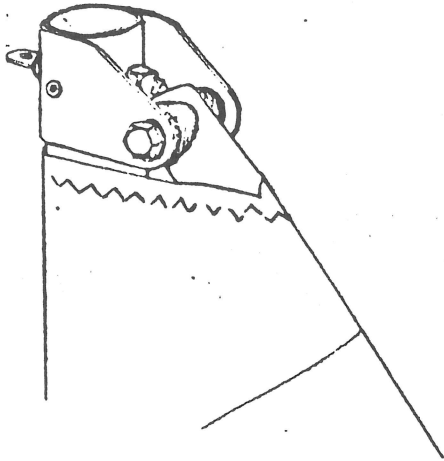
e) Assemble #914 bushing, #916 pulley, UP elevator cable (over pulley) with #998 guide onto bolt at brkt. on vert.stab L/E. Tighten bolts.

NOTE: Brass bushing is slightly larger than the width of the pulley. Tightening the bolt should clamp the guard onto the bushing allowing the pulley to rotate freely.

8.) Insert eye bolt 1/2W/W/AN43B-20A/W/T from rear through 1/4" hole in bottom of tail post, finger tighten only.

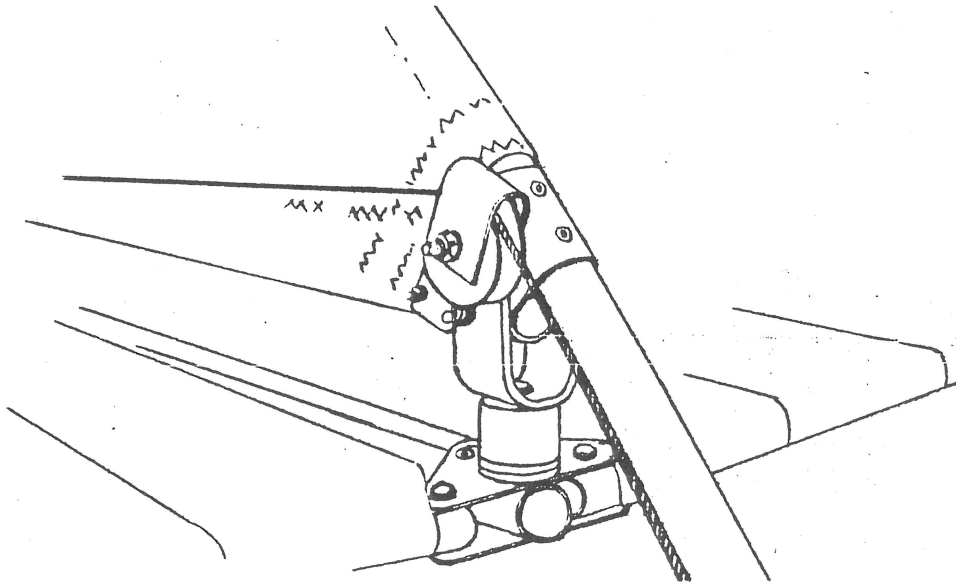
9.) Insert #501 1-1/4" end cap into vertical stabilizer tail post at top then drill 1/8" and secure with 1/8"x 1/8" grip AA rivet.

Vertical Stabilizer L/E

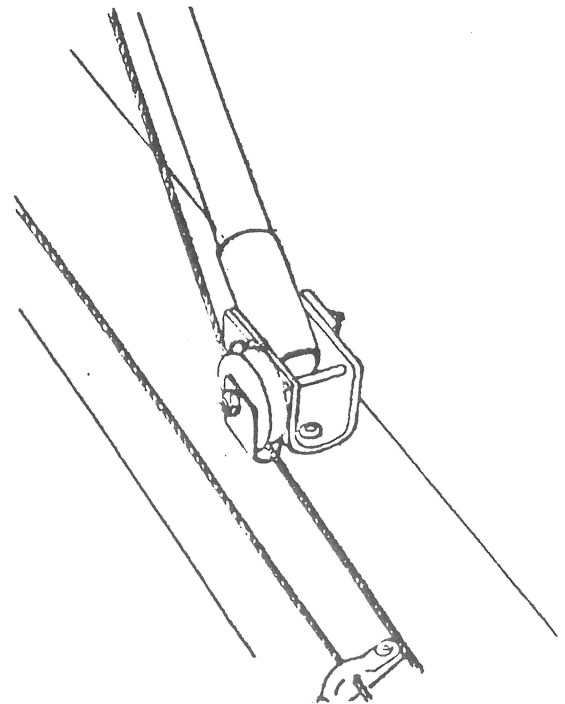


Vert. Stabilizer Attachment
at top of tail post.

Horizontal Stabilizer at Vertical Stab,
Pulley Attachment



Vertical Stabilizer at Fuse Tube,
Pulley Attachment



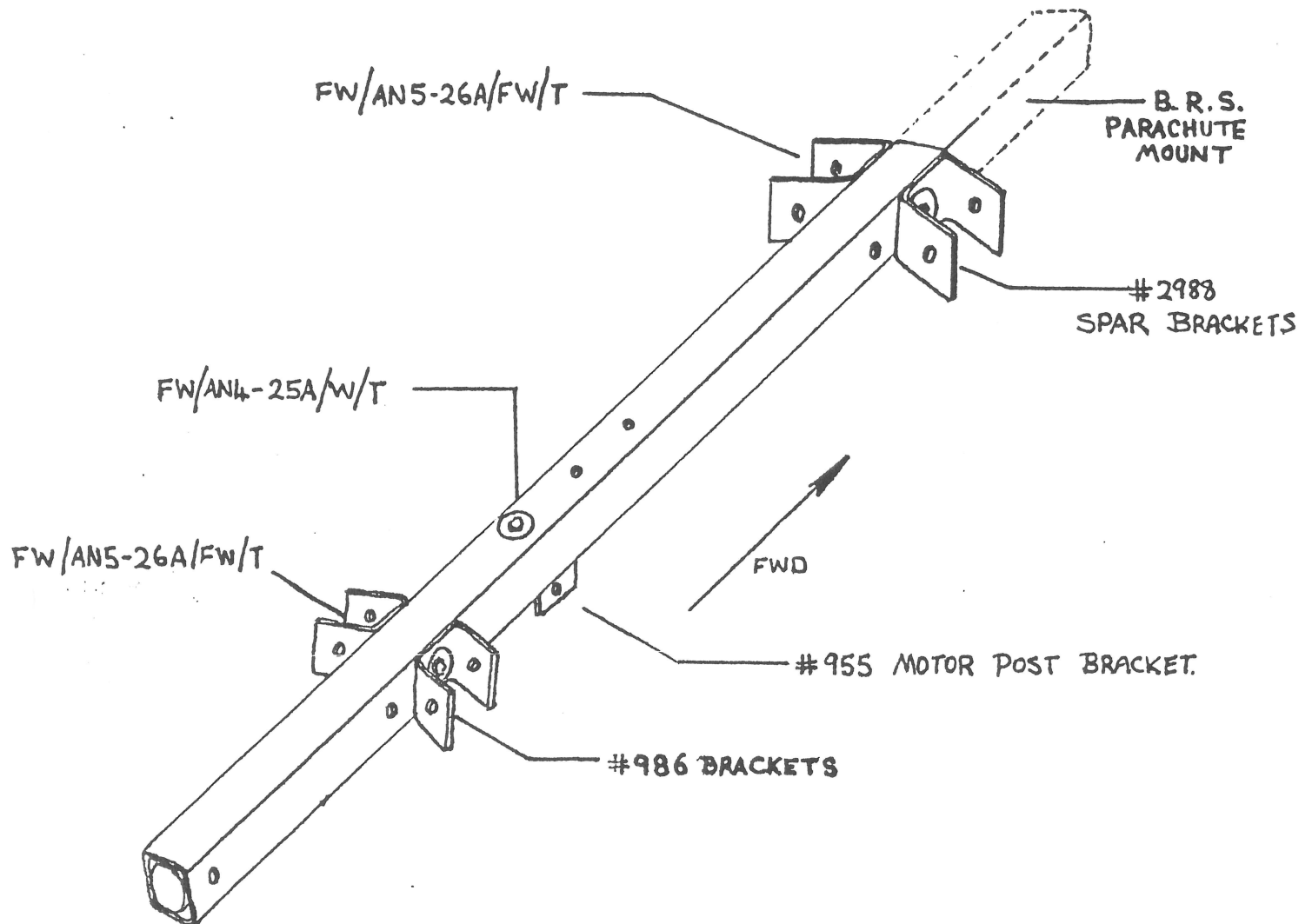
Elevator Control Schematic

UP Elevator

Down Elevator



Rx-550
DRG 13:01



NOTE: SLEEVE DESIGNATES
REAR OF KEEL

SECT.B STEP #14: DOWN TUBE AND KEEL INSTALLATION

Parts Requirements

Part No.	Description	Qty. Rq'd
508	1 1/8" Saddles	4
2606	Motor Post	1
2607 L&R	Main Down Tubes Rear	lea.
2608 L&R	Main Down Tubes Front	lea.
2612	Front Foot Pedal Down Tubes	1
2636	Torque Plate	1
817	Front Starter Pulley	1
2818	Rear Starter Pulley	1
913	1/8" Plastic Washers	2

Bolt Requirements Qty.

AN3-16A	1
AN4-15A	2
AN4-17A	1
AN4-22A	1
AN4-34A	3
AN5-50A	1
AN5-51A	1

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
S 3/16"	1	W 3/16"	2
1/4"		1/4"	
S 1/4"	3	W 1/4"	14
T 1/4"	4		
5/16"		5/16"	
T 5/16"	2	W 5/16"	3
		FW 5/16"	1

Miscellaneous Qty.

3/16"x 1/4" grip AA rivet	8
3/16"x 1/4" grip SS rivet	9

STEP #14: DOWN TUBE AND KEEL INSTALLATION

1.) a) Slide the right front down tube #2608-R over the right front L/G plate. Work the slotted plug (in the end of the downtube) over the plate until, the holes align with the plate, or until the plate butts against the end of the slot. If the latter occurs you will be required to file the tops of the plates until a proper fit is achieved. CHECK for foreign material inside the plastic slot.

b) Once the holes are aligned, push W/AN4-34A/W/T through until it just passes through the tube, and install a #508 1 1/8" saddle, #913 1/8" th. plastic washer and then another #508 saddle.

c) Before installing rear downtubes rivet the plastic plugs in place, top and bottom, using 3/16"x 1/4" grip AA rivets (4 req'd) per downtube. DO NOT place rivets into front downtubes as there are bolts req'd there.

d) Slide the rear right down tube #2607-R over the rear pl. until it lines up with the hole and push the bolt through both plates and downtubes. There should be a thick washer on each side of the AN4-33A with a thick nut.

e) Repeat for the left side.

2.) Install Motor Post #2606 to bracket at Stn. #5, on the fuse tube using W/AN4-22A/W/T. Make sure to put the bevelled end in such that it allows the tube to lean ahead as it must do once the keel is installed.

3.) KEEL INSTALLATION:

a) Install the keel to the front downtubes by inserting W/AN5-50A/W/T through the left front downtube, through the keel (at the hole behind the front spar brackets) and through the right front down tube.

b) Install the rear down tubes to the hole just behind the rear spar brkt's, using a W/AN5-51A/FW/T inserted from port to starboard. Finger tighten.

c) Install #2818 pulley strap to the outside of rear right downtube with fender washer to outside. Tighten nut.

4.) Attach the motor post to the bracket on underside of keel with W/AN4-17A/W/S. The motor post bolts should be snug to the point where there is definitely no slop between the bracket and tube and even slightly ovaling the tube (slight oval means about 1/32" flattened out of round), or one revolution on the nut.

5.) Installation of front pedal downtube;

a) Prior to installation, #817 pulley strap must be looped around tube for the engine starter rope. See detail 'A' dwg. 14:01.

b) Install #2612 front pedal downtube to underside of keel with W/AN4-34A/W/T inserted from top of the keel. Bolt should pass through loop of webbing.

c) Attach the bottom of the downtube to the already installed #953 brackets on the front plates, using W/AN4-15A/W/S. (2 req'd)

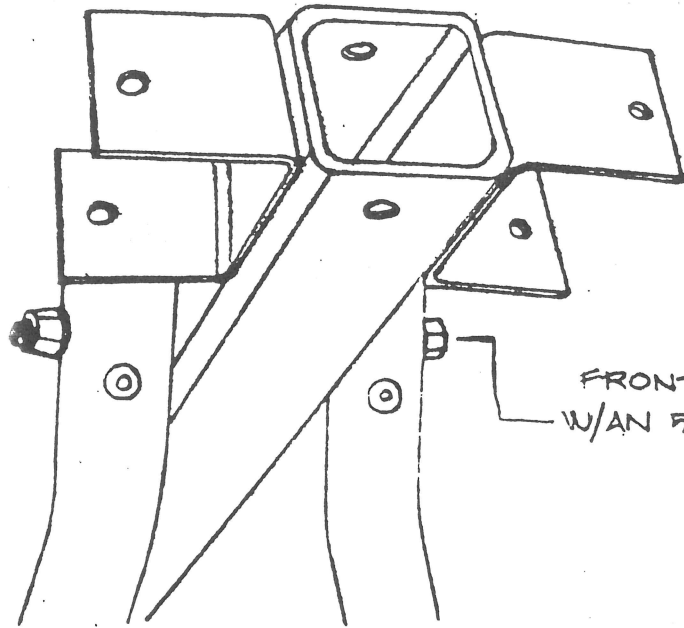
6.) a) Position #2636 torsion plate behind rear downtubes close to the keel, with the bend flush with the motor post and the edges square with the rear downtubes. Clamp pl. in position.

b) Drill through center hole pre-drilled in torsion pl. and into motor post. Carefully align drill and complete drilling through. Insert W/AN3-16A/W/S from rear of pl.

c) Drill #11 through four corners of pl. into rear downtubes, and secure with 3/16"x 1/4" grip SS rivets. Drill remaining four center holes and secure with same.

d) Drill #11 through plate above the 3/16" bolt and into the rear side of the motor post for a 3/16"x 1/4" grip SS rivet.

DWG 14:01
'PRELIMINARY'



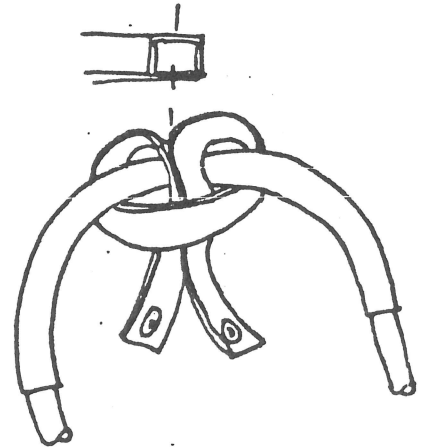
LEFT SIDE



FRONT DOWN TUBES
W/AN 5-50A/W/T.

REAR DOWN TUBES
W/AN 5-51A/W/T.
FROM LEFT TO RIGHT

FRONT



DETAIL 'A'

pulley strap @ Foot
Support tube.

SECT.B STEP #15: SIDE TUBE INSTALLATION

Parts Requirements

Part no.	Description	Qty. Req'd
524	1" Saddles	8
526	1 1/2" Saddles	8
2628 L&R	Pilot Side Tubes	lea.
2630	Rear Foot Pedal Plate	2
2633	Seat Adjustment Plate	4
2980	Ignition Switch Plate	1

Bolt Requirements	Qty.	AN Hardware	Qty.
AN3-15A	2		
AN4-15A	2		
AN4-20A	2		
AN4-21A	6		
AN4-22A	2		
AN4-26A	2		

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
T 3/16"	2	1/2 W 3/16"	4
1/4"		1/4"	
S 1/4"	4	1/2 W 1/4"	2
T 1/4"	10	W 1/4"	18

Miscellaneous	Qty.
3/16"x 1/4" grip SS rivet	4

STEP #15: SIDE TUBE INSTALLATION

1.) a) Install #2628 L&R pilot side tubes, (left tube has 1/4" hole on side for throttle location.) There is a 1/4" hole just aft of the bend which aligns with outside holes of rear pedal X-tube. Check that X-tube has been installed properly by looking for proper alignment of holes..

b) Attach front of side tubes to rear-outside holes in front foot pedal plates. Use #524, 1" saddles on top and bottom of tube and between plates, and secure with 1/2W/AN4-20A/1/2W/S inserted from top.

c) Attach the rear of tubes to the #953 brackets pre-mounted on the front of the side strut x-bar at each end. Use 1/2W/AN4-15A/1/2W/S inserted from top.

2.) a) Position #2630 rear foot pedal plates, one each side, on top of X-tube and align holes so that edge of the plates are flush with the side tubes.

b) Insert W/AN4-26A/W/T through from top of side tube, with #524, 1" saddle under tube and on top of plate. Foot pl. is flush mounted to X-tube.

c) Align 3/16" hole on pl. over center of X-tube (outside edge of pl. should be flush with side tubes.) and drill #11 for 3/16"x 1/4" grip SS rivet, one each side.

d) Rear hole in side tubes must be drilled for attaching back of foot pl. Use hole pre-located in pl. and drill 3/16" up through pl. and side tube. It may be easier to locate and drill top hole from above.

e) Place #524 saddle between tube and plate, then secure with 1/2W/AN3-15A/1/2W/T inserted from top.

3.) Installation of #2980 ignition switch plate;

a) Drill a 3/16" hole (left side tube only), 13" from rear edge of tube.

b) Position pl. such that apex (3/8" hole) is inboard and second 3/16" hole is 15" from rear edge, then rivet in place using 3/16"x 1/4" grip SS rivet.

c) Trace drill through forward hole in pl. and secure with same.

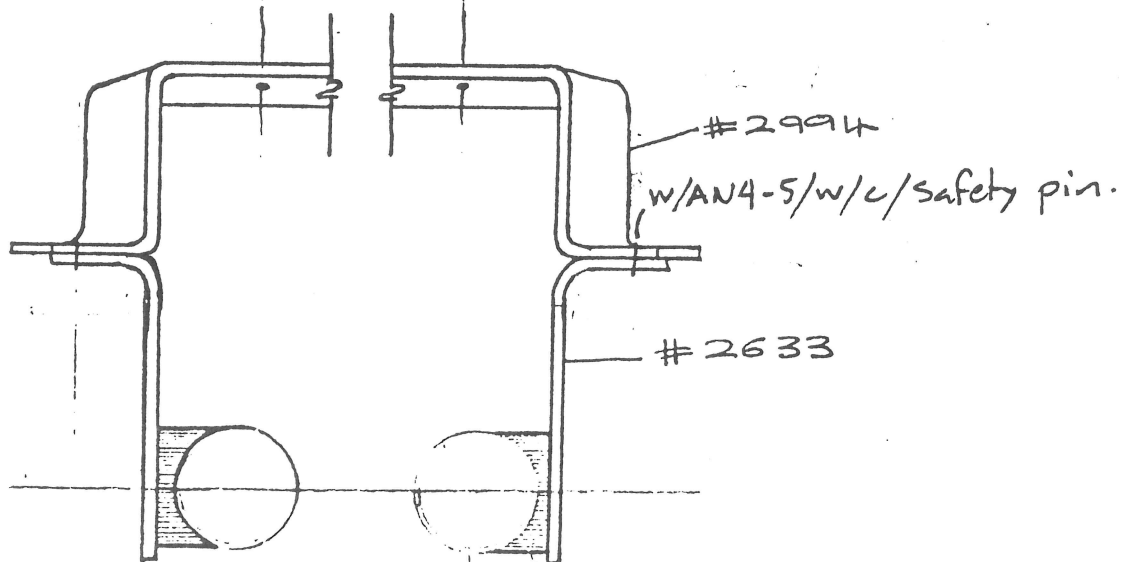
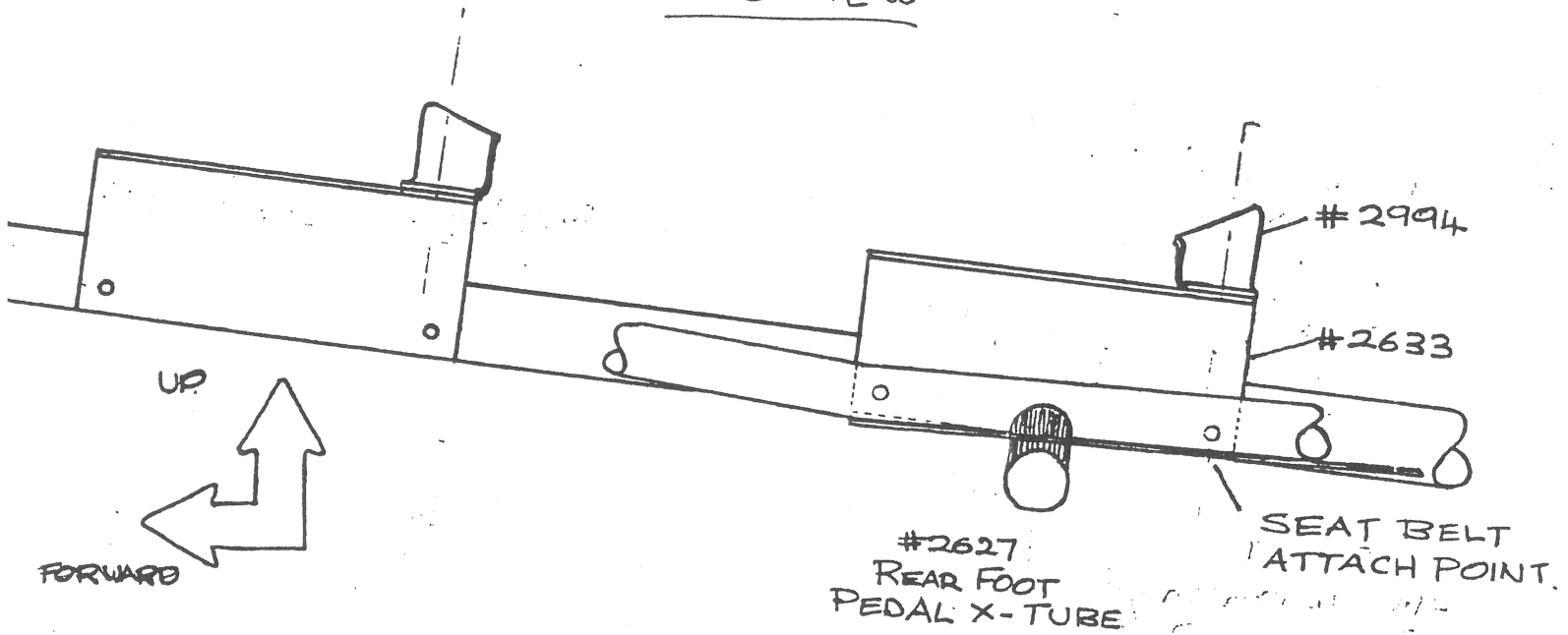
4.) Install #2633 seat adjustment plates to pilot support tubes. (see dwg. 15:01 detail 'B')

a) Attach the forward #2633 seat plates to the outside of the pilot support tubes, (one each side) with #2526, 1-1/2" saddles mounted between. Mount with top flange outboard and secure with W/AN4-21A/W/T (two req'd), inserted from inboard side of tube.

b) Attach the rear #2633 seat plates, in the same manner however use W/AN4-22A/FW/T (finger tight only) in the rear hole for seat belt installation later. In the front hole use W/AN4-21A/W/T and snug down.

15:02 'Preliminary'

FRONT SEAT PLATE Mounting
SIDE VIEW



STEP No.16:

CONTROL TORQUE TUBE ; Assembly & Installation.

Part Requirements

Part No.	Description	Qty. Req'd
405	Universal Nylon Block	1
2410	Torque Tube	1
2429	Elevator Swivel Arm	1
2430	Rear Stick	1
2431	Front Stick	1
2436	Elevator link push rod	1
502	1" End Cap	2
504	Foam Grips (set)	2
912	1/16" x 1/4" I.D. Plastic Washer	1
913	1/8" x 1/4" I.D. Plastic Washer	6
921	Nylon Plug (rear 1" O.D.)	1
922	Nylon Plug (front 1 1/4" O.D.)	1
2935	1/4" Aluminum Spacer	1
2940	Brass Bushing	2
953	Comp. Strut Bracket (block 1")	1

Bolt Requirements	Qty.	AN Hardware	Qty.
AN3-7	2	AN42B-14A	3
AN3-14A	1	(eye bolt)	
AN4-10A	1	AN115-8	1
AN4-15A	1	(shackle)	
AN4-17A	2	AN393-9	1
AN4-27A	1	(clevis pin)	
AN4-32A	1	AN380-2-2	3
		(cotter pin)	

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
S	1	1/2 W	10
T	3	W	9
C	2		
1/4"		1/4"	
S	3	1/2 W	11
T	3	W	3

Miscellaneous	Qty.
3/16"x 1/4" grip AA rivet	3
3/16"x 3/8" grip AA rivet	2
3/16"x 3/8" grip SS rivet	9
#8x 3/8" screw	1

STEP #16: CONTROL TORQUE TUBE INSTALLATION AND ASSEMBLY

1.) Mount #921 nylon plug on front of the side strut x-bar at stn.No.3 on the fuselage. Install to the center hole with 1/2W/AN4-32A/W/W/t inserted through nylon plug, then through X-bar. Place washers each end of bolt and between parts.

IMPORTANT NOTE: When securing #921 plug, the bolt must only be tightened enough to leave about .010" end play on the nylon plug to allow friction free rotation. There must be at least 2 threads showing beyond the nut. It takes less than a 1/4 rotation of the nut to achieve .010" of clearance on a 1/4" AN bolt.

2.) Install #953 bracket under the previously installed control stick mount plate (#966), with a #2935, 1/4" aluminum spacer between the pl. and brkt., using 1/2W/AN4-10A/1/2W/T. Insert from top and torque to 30 in. lbs.

3.) Pre-assemble front universal; (see detail 'B', dwg.16:01) Attach #405 universal block to #922 nylon plug with a 1/2W/AN4-27A/W/1/2W/T (inserted through plug) and again tighten the nut properly for friction free rotation.

4.) Installation of torque tube;

- a) Slide the aft end of #2410 control torque tube over nylon swivel plug mounted to X-bar. (see dwg.16:02)
- b) Slide the #922 plug and assembly into the 1 1/2 square at the front of the torque tube, then position the #405 universal block into the #953 bracket so that the mounting hole is above the bolt. Fasten with a 1/2W/AN4-15A/1/2W/S.

5.) Align the torque tube for and aft so that the rear of the tube is approx. 1/8" in front of the X-bar. Secure the torque tube in place with one #8 x 3/8" screw at the rear, into the #921. Be careful not to drill in too far so as to touch the bolt and watch for screw clearance against bolt.

6.) Secure the front square tube to #922 plug using 3/16" x 1/4" grip AA rivets at the top and each side of the torque tube. Be sure not to drill in too far so as to touch the bolt.

7.) Stick Installation; (see dwg.16:02)

- a) Drill four #913, 1/8"th. plastic washers to 3/8" ID hole size. These washers are placed to each side of control stick inside the control box.
- b) Mount the front control stick #2431 and rear control stick #2430 similarly to for and aft control boxes on torque tube. Mount with bends on each stick to rear.

c) Insert #2940 Brass bushing through control box, plastic washers and control stick, retained with 1/2W/AN4-17A/1/2W/S. There is no need to overtighten bolt - feel for smooth operation of the stick and tighten up the bolt to a light snug with min. 2 threads clear, checking that the stick pressure hasn't increased.

8) At the front control box set in a #913 1/8" th. washer with a 3/16"x 3/8" grip AA rivet to the top holes in front of and behind the stick to create a stop for the stick. It is only necessary to do this on the front stick.

9.) Set 3/16"x 3/8" grip SS rivets in all remaining holes in torque tube assembly. (9 req'd)

10.) Cut 5" from each #504 foam grip, (remaining 3" is used for throttle grip.) Insert foam grip to the top of each stick, and place #502 end plug into the tube.

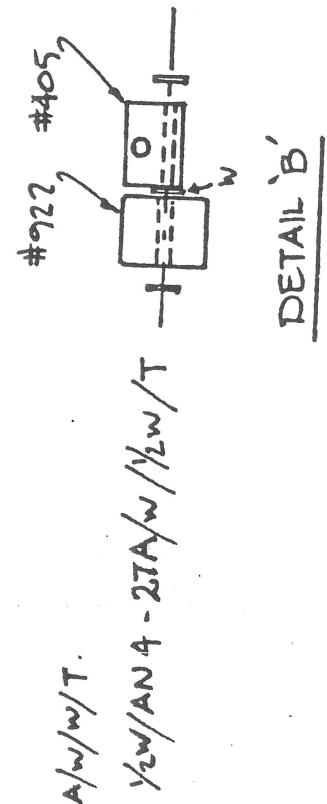
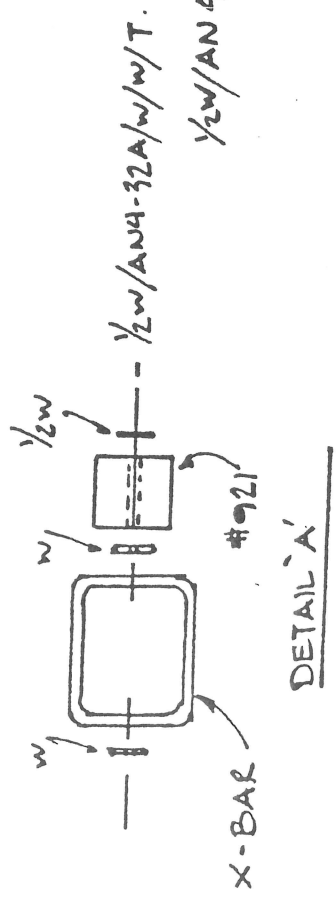
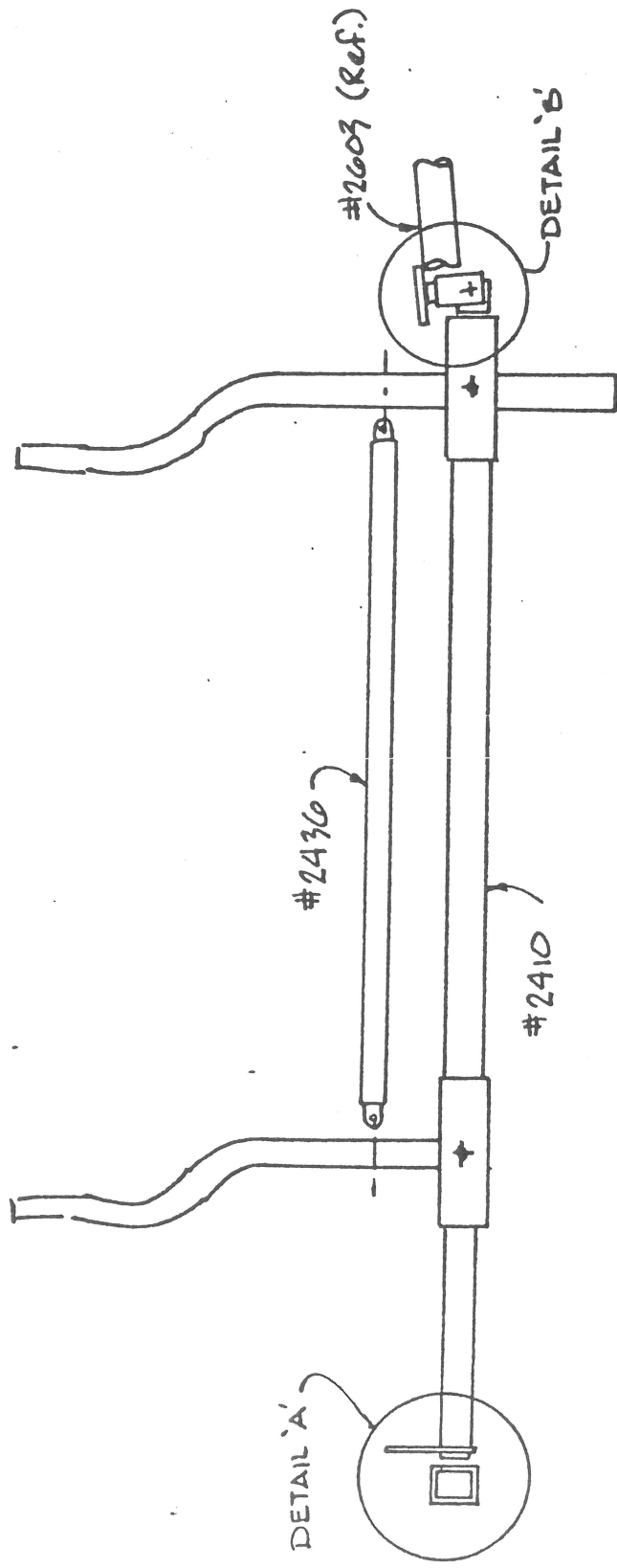
11.) Insert W/W/1/2W/AN42B-14A/1/2W/T eye bolt, through 3/16" hole 2 1/8" above swivel bushing, from (rear) on front stick and from (front) of rear stick. NOTE: The two washers at head of eye are for fine adjustments of the sticks. These can be located to either side of each stick for personal preference.

12.) Install #2436 push rod, between control sticks, to each eye bolt using 1/2W/AN3-7/1/2W/C with cotter pin. (2 req'd)

13.) Install W/AN42B-14A/W/W/T eye bolt to 3/16" hole above push rod on front stick only, insert from rear and tighten.

14.) Attach AN115-8 shackle through thimble on DOWN elevator cable, and attach shackle to eye bolt on front stick using 1/2W/AN393-9/1/2W/ (clevis) and cotter pin.

15.) Attach UP elevator cable to bottom side hole on front stick using W/AN3-14A/W/S through tang on cable with #912, 1/16" th. plastic washer between tang and stick. Attach cable to starboard side, and tighten bolt so that tang is still able to rotate.



DWG: 10:01
Preliminary

SECT.B STEP #17:
FRONT AND REAR SEAT INSTALLATION

Parts Requirements

Part No.	Description	Qty. Req'd
523	Rubber Washer	13
2615	Rear Shoulder strap	1
617	Seat Tank	1
2619	Front Shoulder Strap	2
2620	Seat Belt Clip Assembly	2
2621	Seat Belt Latch Assembly	2
623	Seat Tank Rear Support	1
2624	Front Seat	1
2625	Rear Seat Support (2" Square)	1
2837	Noise Shield	1
2994	Seat Support Brackets	3

Bolt Requirements Qty.

AN3-7A	2
AN3-16A	1
AN4-5	4
AN4-6A	2
AN4-10A	6
AN4-12A	2
AN4-21A	2

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
T -	3	W -	2
		FW -	4
1/4"		1/4"	
T -	12	W -	24
C -	4	FW -	8

Miscellaneous Qty.

3/16"x 1/4" grip AA rivet	6
3/16"x 1/4" grip SS rivet	5
Safety Pins	4
Weather Stripping	12"

STEP #17:
FRONT AND REAR SEAT INSTALLATION

1.) Attach #2994 seat support brackets to the rear-most holes of the seat adjustment plates (#2633) previously installed so that they span from side to side. Install the rear brkt. with the angle up at the back and the front brkt. angling up at the front to create a saddling for installation of the seat. Attach the #2994 with W/AN4-5/W/C/Safety pin. As the nut tightens up give a light tightening with a wrench to ensure there is no slop.

2.) Front Seat Drilling;

a) The marking of the seat for drilling is best done with some assistance for centering the seat and to hold it in place. Check that both of the #2994 seat support brackets are in the rear most setting on the adjustment plates. Place a #523 rubber washer at each of the 4 seat mounting bolt holes, for preventing wear on the fiberglass.

b) Position #2624 front seat onto the #2994 brackets so that the forward lip of the seat is in line with(+,-1/8") the front edge of the forward adjustment plates on the support tubes. This position will set the seat at a good angle however you may find it more desirable to recline the front seat more or less than it is now.

c) Use a critical eye to position the seat in straight, and centered from side to side, then mark four hole positions onto seat through brkt's and rubber washers from underside.

d) Take a reference measurement across to make sure hole center marks on the seat match those on the brackets, and drill 1/4" through seat.

e) Bolt the seat onto the seat mounts using four FW/AN4-10A/W/T inserted from seat side. Be sure the rubber washers are positioned between the seat and the bracket.

3.) Rear Seat Mounts;

a) Install the #2625 rear seat support at Stn.4 on the fuse tube with W/AN4-6A/W/T (2 req'd) inserted from inside the support.

b) Attach #2994 brkt. to the top of the side strut x-bar at stn.3. Center the brkt. on the X-bar with the angle up at the front and mark hole positions. Drill 1/4" straight through the X-bar and secure with W/AN4-21A/W/T inserted from top.

4.) Rear Seat Drilling;

a) Position #617 seat-tank in place with two #523 rubber washers at each bolt location. (total 8 req'd) Temporarily block up rear of the seat to keep it from falling back, and position so that the front lip of the seat is 6 1/2" to 7" in front of the side strut x-bar. Check that there is 5/8" - 3/4" clearance between the seat and the control torque tube horn.

b) Again, check that seat is positioned squarely and centered. Mark drill locations through supports and rubber washers, and compare hole locations to brkt's.

c) Drill 1/4" through seat-tank and fasten using two FW/AN4-12A/W/T at the rear and two FW/AN4-10A/W/T at the front. Be sure there are two rubber washers at each bolt location, then tighten the nuts using all available threads on the bolt.

5.) Installation of seat-tank rear support;

a) Check that all bolts have been properly tightened in order to achieve a consistent height at the back of the seat tank. Apply three strips of rubber weather stripping (longitudinally) to the top of #623 fiberglass seat support.

b) Place the seat support under the rear of the seat-tank with the support approx. 1" farther behind the rear edge of the tank.

c) Center the support over the fuse tube, with the top of the support (not the weatherstripping) 3/8" under the tank.

d) The support is riveted to the fuse tube with two 3/16"x 1/4" grip SS rivets on the starboard side, one front and back, and with three of the same rivets on the left with the extra rivet centered. The elevator cable guides will be attached to the right side center of the support in a later section.

6.) Front Seat Belt Installation

a) The front seat must be cut out for lap belt access through the sides of the seat. Measure approx. 12" from the front edge of the seat and mark two holes 15" apart equal distance from center. Measure 3" from hole center straight back and mark for second hole each side.

b) Drill 3/8" at each location and then cut using key hole saw or jigsaw to create a 3/8" slot x 3" running along each side of the seat.

c) Attach #2619 front shoulder straps to the front downtubes using FW/AN3-7A/FW/T. Use some pliers to curl one end of each FW prior to installation to prevent chaffing the webbing. (see dwg. 17:02)

d) The lap belts are the same for the front and rear seats. Insert #2621 clip and #2620 latch assembly, one through each loop of the shoulder harness, then through the slots (check for correct position of clip assembly) and attach each end to the rear bolt on the seat adjustment plates at each side. The FW should be to the outside, then tighten bolt with strap at a good angle for restraint.

7.) Noise Shield Installation;

a) Measure 19-5/8" down from the top of the motor post, on the rear side of the tube, and locate tube center for drilling. Carefully drill 3/16" through from rear to the front. NOTE: It may be easier to drill one side at a time, locating front hole position and drilling from front.

b) Position #2837 lexan noise shield behind rear downtubes and motor post. Clamp in position, then drill #11 at top corners of shield 1/2" from top edge into rear downtubes. Secure with 3/16"x 1/4" grip AA rivets.

c) Drill #11 @ 1/2" from bottom edge of noise shield as well as center of shield, then secure with 3/16"x 1/4" grip AA rivets.

d) Trace drill through 3/16" hole in motor post and through noise shield.

8.) Rear Seat Belt Installation;

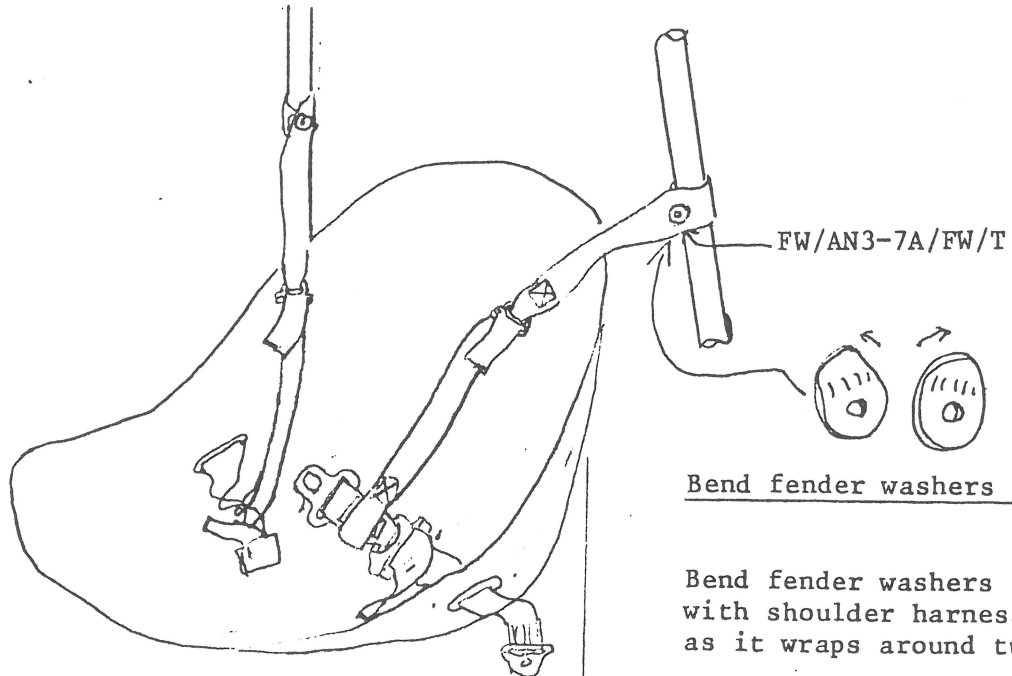
a) Place #2615 rear shoulder harness behind motor post with #523 rubber washer between harness and noise shield. Secure with W/AN3-16A/W/T inserted from front through motor post, shoulder harness, rubber washer, and noise shield.

b) Insert #2620 latch and #2621 clip lap belts through loops in shoulder harness and attach to 5/16" bolts at landing gear connection on L/G X-bar. Tighten nuts with belts at a good restraint angle.

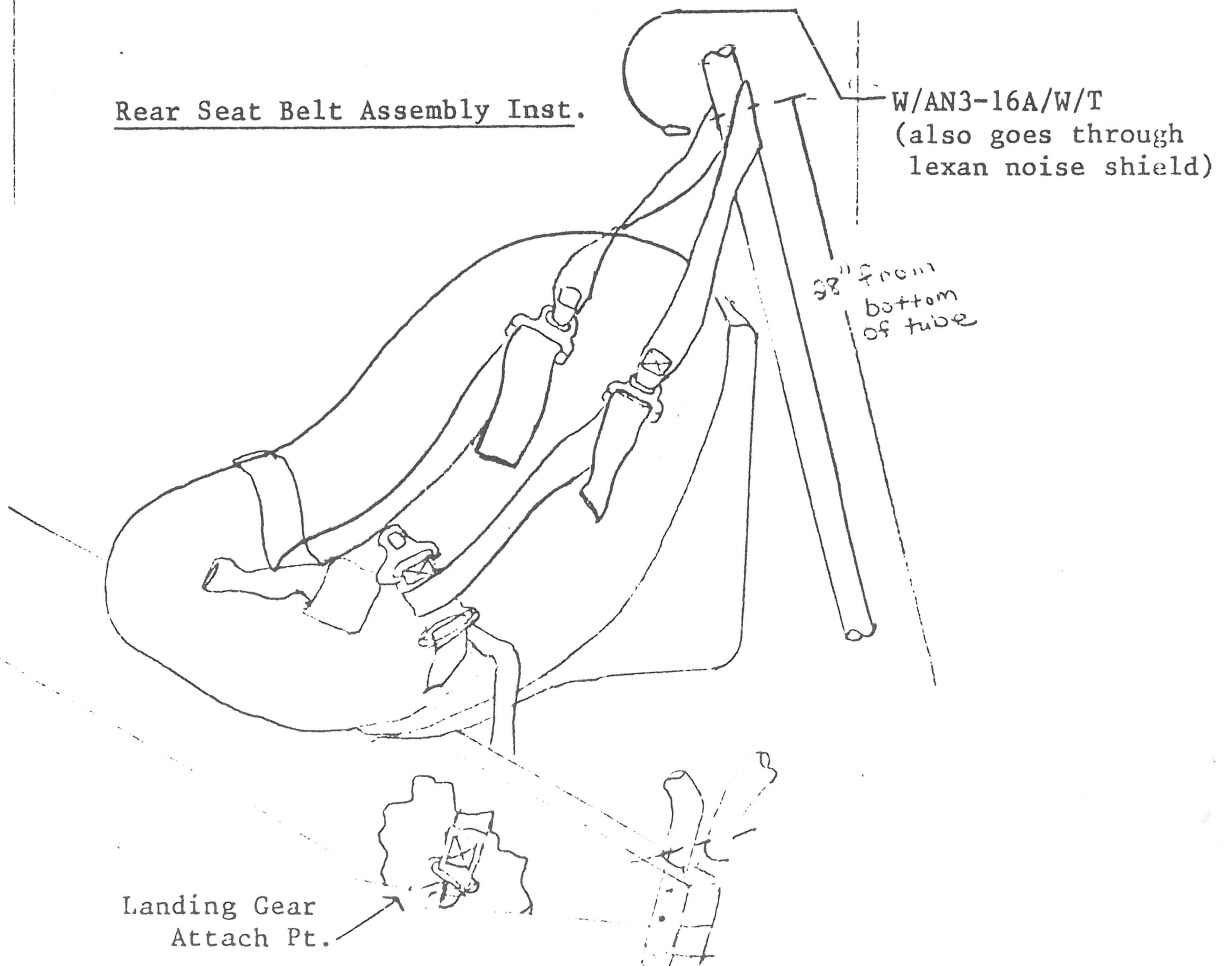
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17:02

FRONT SEAT BELT ASSEMBLY INSTALLATION



Rear Seat Belt Assembly Inst.



STEP #18:

CONTROL LINKAGES; Horizontal Stab. & Elevator Installation

Parts Requirements

Part No.	Description	Qty. Req'd
2314	Forward Horizontal Stab. Struts	2
2315	Rear Horizontal Stab. Struts	2
412 L/R	Rudder Pedal	2 ea.
413	Hinge Brkt.	8
2416-01	Rudder Cable Assembly	2
2416-02	Rudder Cable Assembly	2
426	AN Adjustable rod end	2
826	Cable Clamp	2
914	Pulley Bushing	2
916	Pulley	2
998	Pulley Guard	2

Bolt Requirements	Qty.	AN Hardware	Qty.
AN3-6	6	AN42B-12A	2
AN3-7	8	AN42B-16A	2
AN3-5A	26	(eye bolt)	
AN3-7A	2	AN393-9	4
AN3-22A	2	AN393-11	4
AN4-15	2	(clevis pin)	
		AN380-2-2	24
		(cotter pin)	
		AN115-8	2
		(shackle)	

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
S -	36	1/2 W -	112
T -	2	W -	18
C -	14		
1/4"		1/4"	
C -	2	1/2 W -	4

Miscellaneous	Qty.
5/32"x 1/2" grip AA rivet	2
3/16"x 3/16" grip SS rivet	2
1/4" Bungee cord	2 ft.
SS Safety Wire	12 ft.

SECT.B STEP #18: CONTROL LINKAGES;

1.) Horizontal Surface installation; (pre-covered)

a) Attach the elevator assembly to the horizontal stabilizer, by aligning torque fittings on elevator with eye bolts on horiz.stab. The elevator may be bowed slightly due to sail tension however once installed it will straighten. Attach all hinge points using 1/2W/AN3-7/1/2W/C Cotter Pin. (4 req'd) NOTE: Brkt's on horiz.stab. are on top side, and horns on elevator are on starboard (right) side.

b) Slide the assembly under the vertical stabilizer on the fuselage, from the starboard side.(brkt's top,horns to starboard.)

c) Attach the forward bracket (#950) on the horiz.stab. to the front brkt. located at the leading edge and keel of the vertical stabalizer using a W/AN4-15/W/C Cotter Pin. The 1/4" hole may need a light drilling for bolt clearance.

d) Check that sail has been hot knifed at the rear hole location then attach rear bracket (#982) to the keel using a W/AN4-15/W/C Cotter Pin.

2.) Front Horizontal Stab. Struts;

a) Locate the 3/16" holes on the L/E of the horiz.stab. just inboard of the internal compression struts. Burn, or cut holes in the sail and insert W/AN42B-12A/W/S/S from the bottom-up.NOTE: Two shear nuts were just called for on the eye-bolt. Tighten first nut until just snug onto the L/E then use the second nut for a double safety. Back-up the first nut by tightening the two together.

b) Connect #2314 forward struts to the bracket at Stn. #7 located under the fuselage using 1/2W/AN3-7A/1/2W/T on each side.

c) At the adjustment end of each strut turn on a 1/4" shear nut followed by #426 female fork end.NOTE: the shear nut will be used to back-up the rod end once positioned.

d) Adjust the fork end on the strut initially by eye so that once attached to the eye bolts at the L/E, the horiz.stab. will be square with the vert.stab.

e) Temporarily connect the struts to the eyebolts using 1/2W/AN3-6/1/2W/C Cotter Pin. Make any fine adjustments neccessary to square up the L/E then secure attachment point at fork end, and back up the shear nut onto the fork. NOTE: #426 fork end has a small hole on its side for inspecting proper thread grip.If you can see light through this hole you MUST turn the fork farther onto the male end, irregardless of position of L/E.

3.) Rear Horizontal Stab.Struts;

a) Locate 3/16"holes in the horiz.stab. T/E outboard of the internal compression struts. Burn or cut holes in the sail and install 1/2W/AN42B-16A/W/S/S eyebolt to each side, in the same manner as detailed previously.

b) Attach #2315 rear stab.struts to the eyebolt located at the bottom of the tail post.(see dwg.18:01) Place 1/2-Washers between tail post and strut as well as between each strut.

c) Attach the rear struts to the eyebolts on the trailing edge using 1/2W/AN3-7/1/2W/C Cotter Pin.

4.) ELEVATOR LINKAGES;

a) Locate the UP elevator cable which passes through the two pulleys on the vertical stab., and trace the cable to the front of the aircraft checking for any kinks or frays. Inspect proper attachment of tang to bottom of control stick, and then inspect DOWN elevator cable connected at the eye bolt above. Trace the cable back along the fuse tube through the last cable guide, again checking for kinks or frays.

b) Attach the turnbuckle of the DOWN elevator cable to the bottom horn of the elevator using AN393-11 clevis pin/1/2W/Cotter Pin.

c) Attach the UP elevator cable to the top horn of the elevator using AN393-11 clevis pin/1/2W/Cotter Pin.

d) Hold the elevator in the neutral position and tighten turnbuckles to take out any slack. From the front of the aircraft pull the control stick full back; the elevator should be in the full up position. Push the control stick full forward and the elevator should be in the full down position.

NOTE: Cables should be snugged at the turnbuckles without excess tensioning, which will cause premature wear. A rule of thumb is to tension cables just until the elevator will remain in a neutral position when the control stick is released.

5.) Cable Guide Attachment;

a) Attach the cable guide to the fiberglass seat support in a position which is natural for cable alignment.

b) Center the guide on the support and drill 5/32" then set with 5/32"x 1/2" grip AA rivets.(2 req'd)

6.) ADJUSTING STICK TRAVEL;

With the control sticks full aft the elevator trailing edge should raise 10"-11" from being level with the horizontal stabilizer. With the stick in the full forward position the elevator trailing edge should drop 5 1/2" to 6". Check that when the front stick is fully forward, the top of the rear stick has from 1/4" to 1/2" clearance behind the front seat.

7.) Post Assembly;

Once satisfied that the elevator system is functioning correctly, you must safety wire the rear turnbuckles. Refer to the pre-assembly section of the manual for safety wiring procedures.

8.) Rudder Installation;

a) Attach the rudder to the vertical stabilizer trailing edge using a 1/2W/AN3-7/1/2W/C Cotter Pin.(two req'd)

b) Connect the rudder cable turnbuckles to the horns on each side of the rudder, using AN393-9 clevis pin/1/2W/Cotter Pin. Check that there is 3" to 4" of the nylon outer casing for the cable, projecting out of the fuselage.

9.) Rudder Pedal Hinge Sub-Assembly;

Pre-assemble the eight #413 hinge brkt's to produce four rudder pedal hinges. (see dwg.18:02)
Use 1/2W/1/2W/AN3-5A/1/2W/1/2W/S (8 req'd) for assembly, with the 1/2Washers each end of the bolt and between the brkt's.

10.) Front Foot Pedal Installation

a) Locate and drill 3/16" at 1-1/2" forward of the two center holes on front foot support plate. (see dwg.18:03)
This hole will properly position the hinges for and aft.

b) Insert 1/2W/AN3-6A/1/2W/S to inboard side of hinge, through locating hole in plate. (pedal side of hinge to rear)
NOTE: The second attachment hole is adjustable to personal preference.

c) Clamp #412 L to left hinge and #412 R to right hinge with the bottom edge of the pedal flush with hinge bracket. Trace drill 3/16" (two holes) through rear of hinge and through pedal and secure with 1/2W/AN3-5A/1/2W/S.

d) The positioning range for pedals is from, square with first locating hole, to 1/2" farther back. Adjust the pedal for preference, then drill 3/16" through plate and secure with 1/2W/AN3-5A/1/2W/S. Locate hole for opposite pedal in same location and secure with same.

11.) Rudder Cable Attachment;

a) Attach #2416-02 rudder cables to the front pedals using 1/2W/AN3-6/W/1/2W/C Cotter Pin. Position so that the head of the bolt is on the foot side of the pedal, with a washer between the cable bushing and the flange.

b) Run the cable parallel to the pilot support tubes. At station 1 of the fuse tube use #826 cable clamp, (one each side) and secure the nylon tube to the bracket with 1" of tubing behind the clamp. Use W/AN3-5A/W/S through the clamp and attach to the 1/4" hole on stn.1 brkt. (see dwg.18:03)

c) Drill #11 through the clamp and the top of the angle brkt. at stn.1 then secure with 3/16"x 1/4" grip SS rivet.

d) Insert AN115-8 shackle through thimble at end of cable and attach to the double tang on the rudder cable exiting from fuselage, using AN393-9 clevis pin/1/2W/Cotter Pin. Allow from 3" to 3-1/2" of nylon tube to protrude from fuse tube at rudder cable entry.

12.) Pulley Installation;

a) Insert #914 brass pulley bushing into #916 1-1/2" dia. pulley. Pulley rotates around bushing, CHECK for freeness of rotation. If pulley is stiff to turn you will be required to drill out pulley with letter 'O' or 'P' drill. (8.2mm) A small amount of silicone spray will help.

b) With cable under pulley, place #998 guard around pulley and attach to 3/16" hole on support tubes in front of the control stick mount. Use 1/2W/AN3-22A/1/2W/1/2W/S inserted through pulley mounted to inboard side of support tubes, with 1/2 washer between guard and tube. CHECK; All attachment points for cables and general smoothness of operation.

13.) Rear Pedal Installation

a) Locate and drill 3/16" hole on rear foot plates, 4" inboard of outside edge, and 1-3/4" aft of front edge of plate. (see dwg.18:03)

b) Attach the inboard hole of the pedal hinge to the locating hole using 1/2W/AN3-5A/1/2W/S.

c) Clamp #412 L&R rudder pedals to the hinges, at each foot plate, and drill 3/16" through the rear of the hinge and rudder pedal on the inboard hole ONLY! Secure with 1/2W/AN3-5A/1/2W/S inserted from pedal side.

d) Locate the outboard attachment hole for the hinge approx. 3-1/8" aft of the forward edge of the plate. Clamp the hinge temporarily in this position.

e) Attach #2416-01 rudder cables to the rear pedals using 1/2W/AN3-6/W/1/2W/C Cotter Pin. Position so that the head of the bolt is on the foot side of the pedal, with a washer between the cable bushing and the flange.

f) Attach the turnbuckle on the cable to the double tang on the rudder cable exiting from the fuselage with AN393-9 clevis pin/1/2W/Cotter Pin. Adjust each turnbuckle so that the threads are 1/4" inside the barrel.

g) With the assistance of another person, sit in the rear seat and find a comfortable position with your feet on the pedals so that you are able to fully deploy each pedal. The important note here, is to provide adequate clearance between the top of the foot pedal and the sides of the front seat, and also not let it bind against the side tube.

h) The rudder pedal will need to be angled slightly down on the outboard end of the hinge (approx. 1/8"-1/4") to allow clearance from seat. Check positioning of pedals each side and drill 3/16" for hinge attachment to plate, and for pedal attachment to hinge. Secure each with 1/2W/AN3-5A/1/2W/S.

14.) Rudder Pedal Bungee Installation;

a) Locate and drill #11 at 5" forward of the rear foot support plate on the underside of the side tube. Set a 3/16"x 3/8" grip SS rivet, with 4 washers on the rivet to create a stop for the bungee.

b) Cut two pieces of 1/4" bungee cord at 12". Attach the bungee cord ahead of the rivet and tie a bow line around the tube. Drill a 1/4" dia. hole in the top inboard corner of the rudder pedal and ream the edges well. Push the rudder pedal into the full down position, and push the bungee cord through the 1/4" dia. hole and tie a knot.

NOTE: There should not be tension on the bungee cord when the foot pedal is in the fully deployed position and slight tension when the foot pedal is in the neutral position. Over tightening of the bungee cord will result in a greater effort required to operate the pedals.

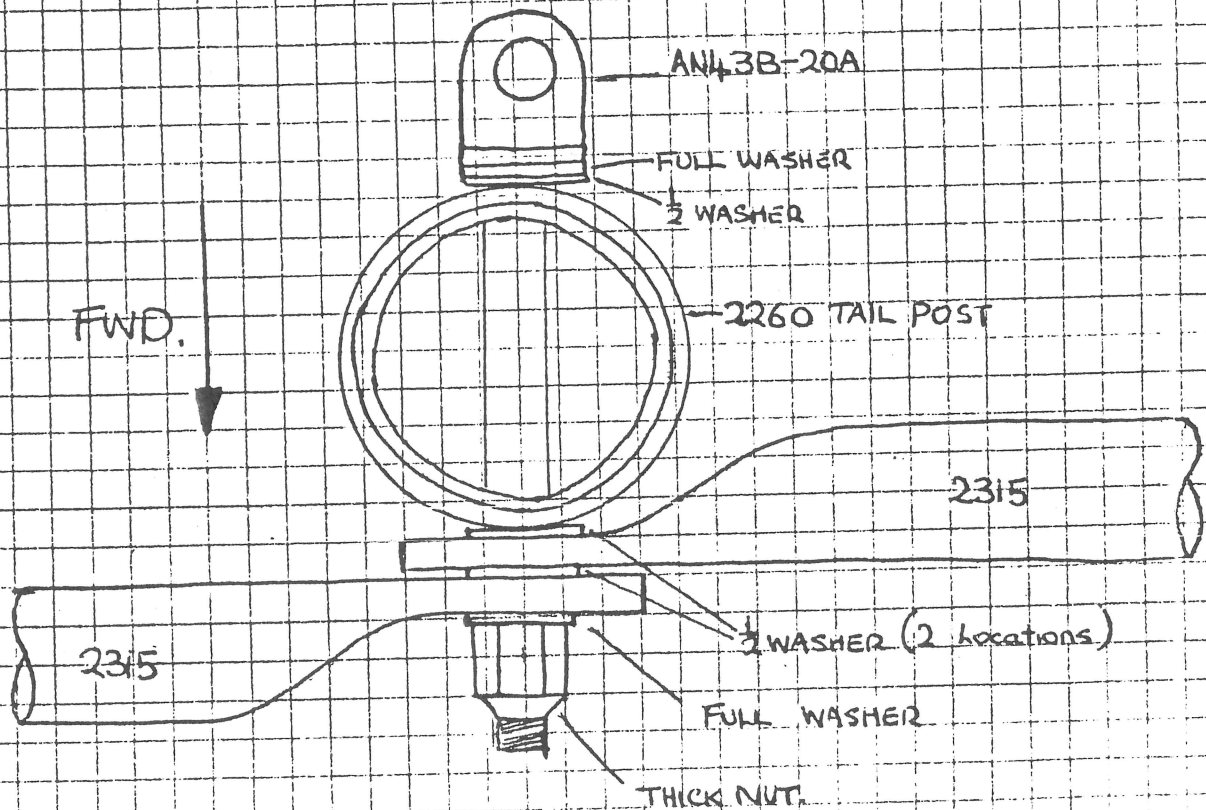
15.) Post Assembly;

Once satisfied that the system is functioning correctly, inspect all fastened points, and safety wire all four of the turnbuckles.

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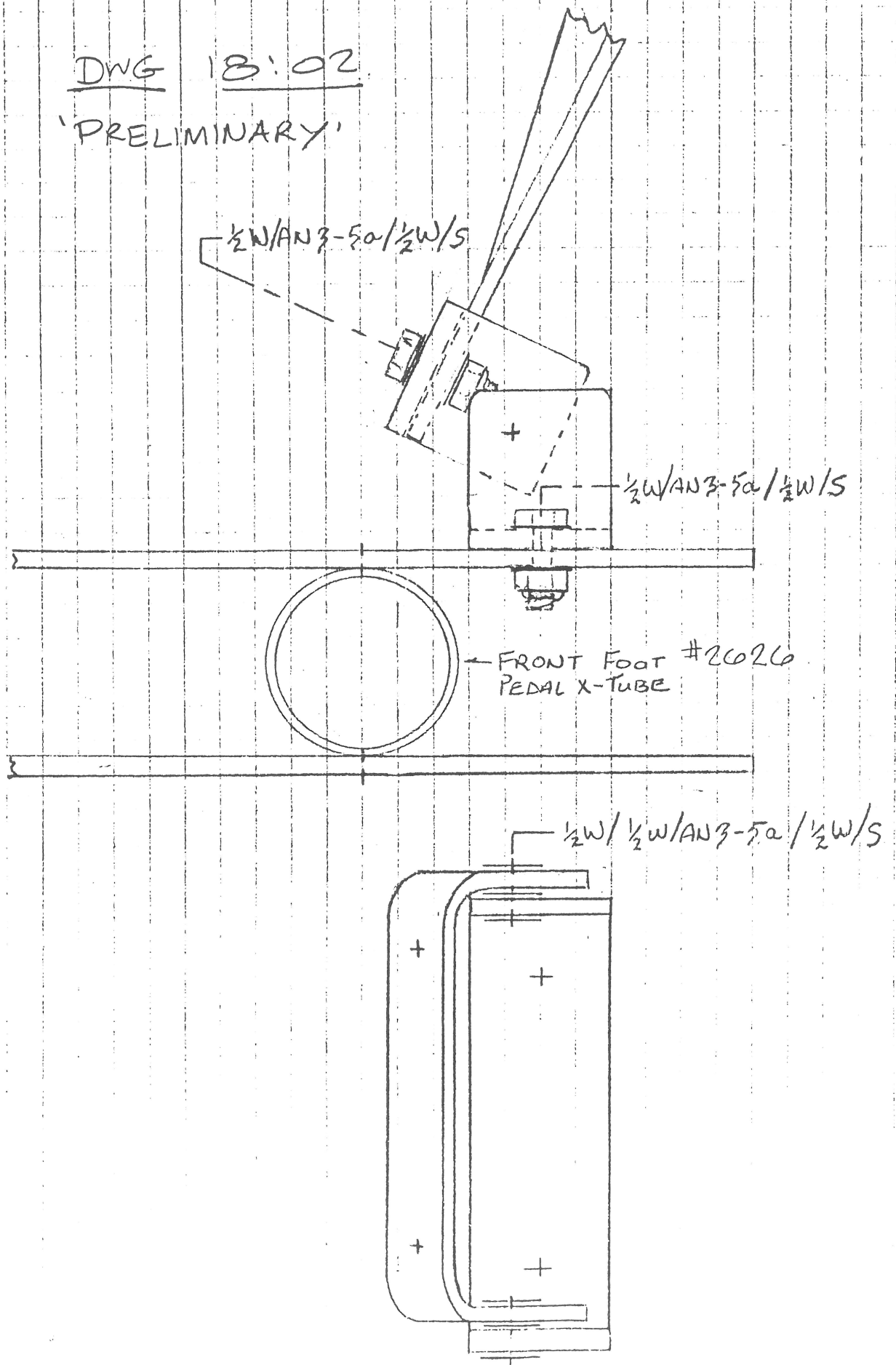
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HORIZONTAL STAB STRUT ATTACHMENT AT TAIL POST.
(VIEW LOOKING DOWN TAIL POST)

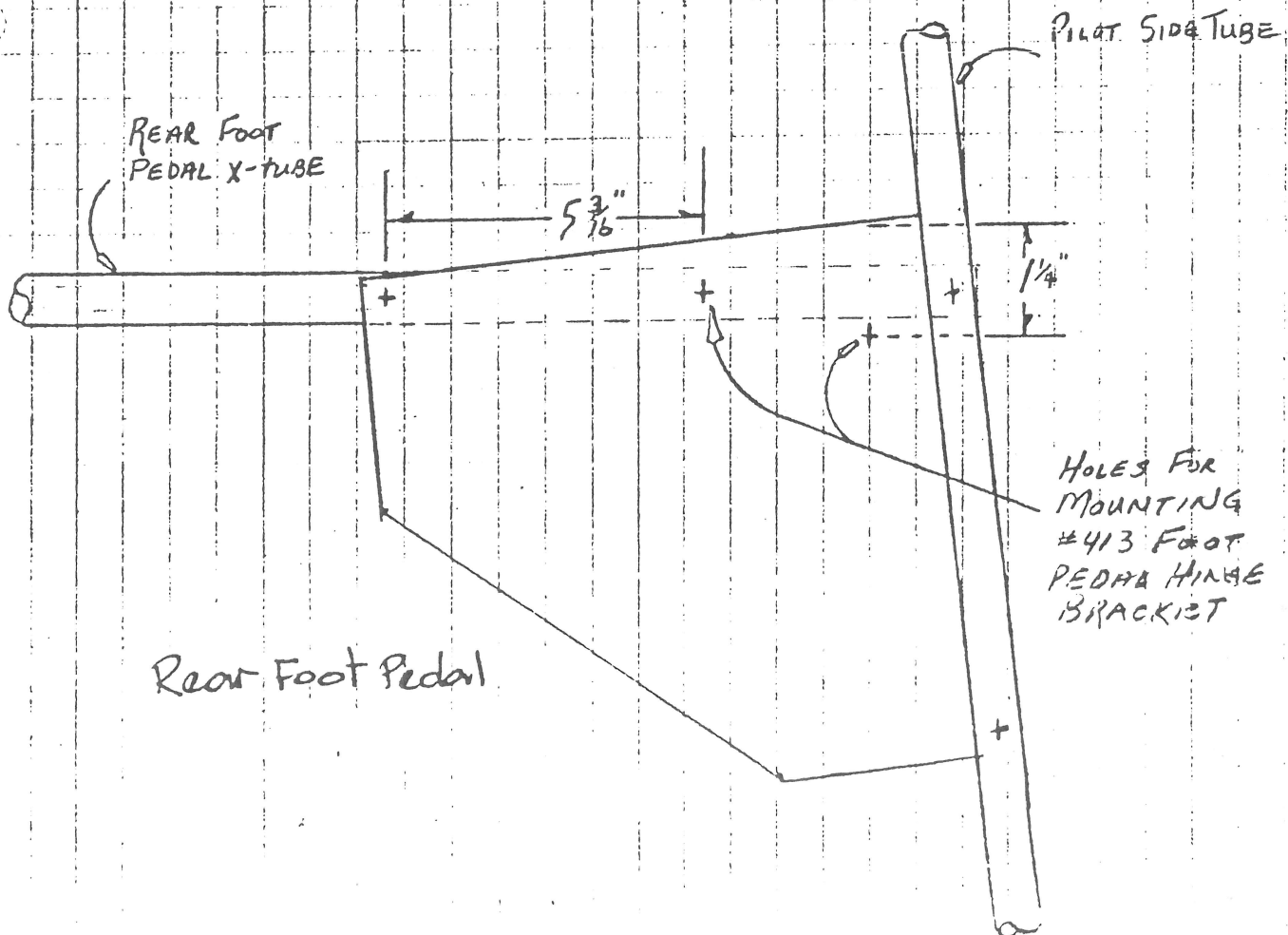
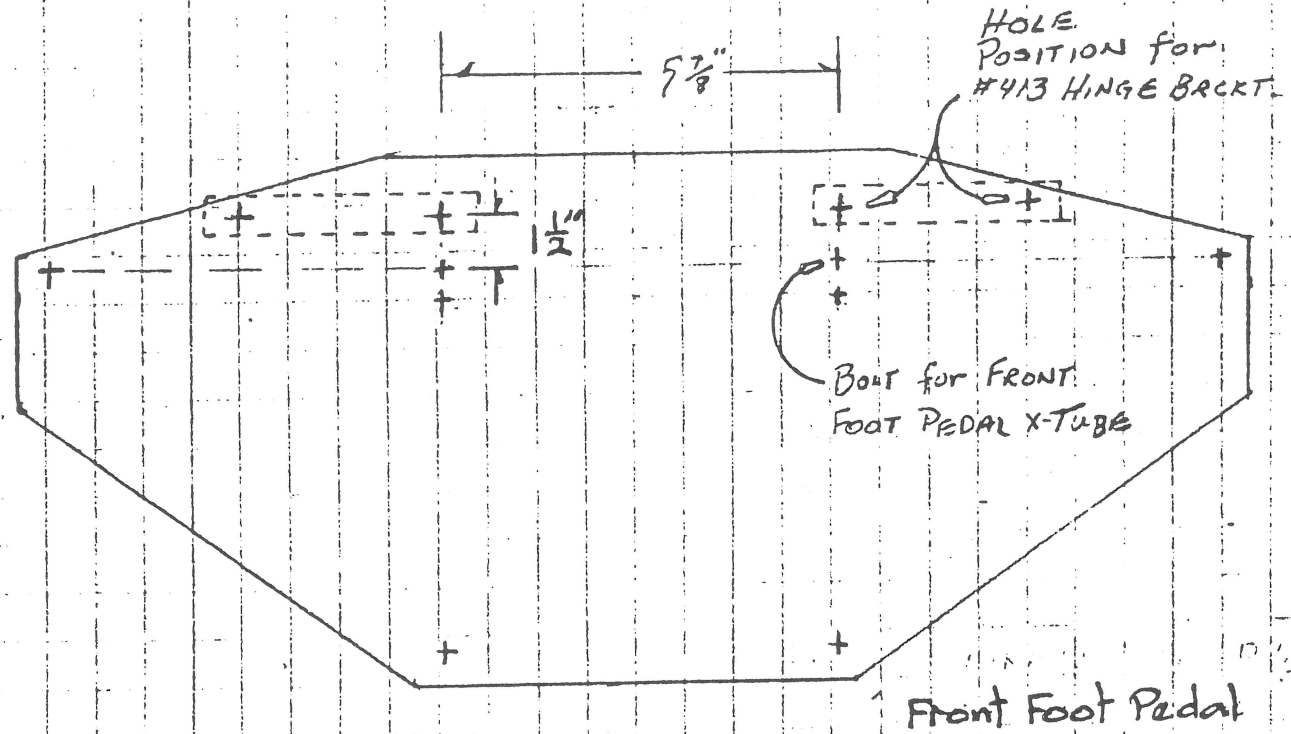


APRIL 30, 1985.

DWG 18:02
'PRELIMINARY'



DWG 18:03 Preliminary



SECT.B STEP #19:
FRONT FORK & TAIL WHEEL ASSEMBLY

Parts Requirements

Part No.	Description	Qty. Req'd
405	Nylon Universal Block	1
2707-01	Front Fork	2
2707-02	Fork Plate	1
708-01	Extension Tube	1
2708-01	Tail Wheel Plates	2
2708-02	Tail Wheel	1
2708-03	1/2"x.049 Bushing (1-1/2")	1
2711-01	1/2" Dia. Axle	1
2711-02	5/8" Dia. Bushing	1
2711-03	3/4" Dia. Retainer Bushing	2
904	Swivel Plug	1
913	1/8" Plastic Washer	2
2939	Tail Wheel Bushing *	1
	(*installed in wheel)	

Bolt Requirements Qty.

AN3-10A	2
AN3-21A	2
AN4-20A	1
AN4-23A	1
AN5-21A	1

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
S 4	4	1/2 W 8	8
1/4"		1/4"	
S 2	2	1/2 W 7	7
5/16"		5/16"	
T 1	1	1/2 W 4	4

Miscellaneous Qty.

#8x 1/4"screw	2
3/16"x 1/4"grip SS rivet	6
1/4" Bungee Cord	4 ft.

SECT.B STEP #19:

FRONT FORK & TAIL WHEEL ASSEMBLY

1.) Front Fork Assembly;

a.) Gather all required parts for fork assembly. (see dwg.19:01)

b.) Insert #2711-01, 1/2" aluminum axle, through the 1/2" hole of #2707-01 fork, then slide #2711-02 wheel bushing over axle with #2711-03 retainer bushings over it. Slide second fork #2707-01 onto opposite end of axle.

c.) Clamp #2707-02 X-plate, 7/8" from ends of each fork, positioned flush each side. Use a square, and then check that distance between forks is equal each end.

d.) Trace drill #11 through the four holes in X-pl. and secure with 3/16"x 1/4" grip SS rivet each time a hole is drilled. NOTE: Square the fork assembly after each hole and rivet are inserted.

e.) Drill #11, between the two rivets at each end and secure with 3/16"x 1/4" grip SS rivets.

f.) Drill 3/16" through the front side of each fork and through the centre of the axle at each end. Hand tighten 1/2W/AN3-10A/1/2W/S. (Fork assembly is installed in later section of the manual.)

2.) Tail Wheel Assembly;

a) Assemble #904 swivel plug, to #405 universal block. (see ref.dwg.19:02) Use 1/2W/1/2W/AN4-23A/1/2W/S inserted through universal block, with a 1/2 washer at each end of bolt, and between the block and the swivel plug.

NOTE: When assembling the universal joint, the bolt must only be tightened enough to leave about .010" of end play between parts to allow friction free rotation. There must be at least 2 threads showing beyond the nut. It takes less than a 1/4 rotation of the nut to get .010" of clearance on a 1/4" AN bolt.

b) Slide the swivel plug into #708-01 tube, then drill 1/8" hole approx. 3/8" deep (be carefull not to touch the bolt) at 3/8" from edge of tube. Set with #8x 1/4" screw.

c) Attach #2708-02 tail wheel between #2708-01 plates at 1/4" hole on end of plate. NOTE: Check that #2939 bushing is inserted into tail wheel, and drill 1/4" hole to 5/16" (if req'd) for 1/2W/1/2W/AN5-21A/1/2W/1/2W/S with 1/2 washers placed each side of plates.

d) Attach the plates to the universal block with #913, 1/8" th. plastic washer placed each side of the block between the plates. Use 1/2W/1/2W/AN4-20A/1/2W/1/2W/S with a 1/2 washer placed each end of the bolts and against the nylon block between the plastic washers.

e) At the top end attach #2708-03 bushing between plates and insert 1/2W/AN3-21A/1/2W/S through plates and bushing.

f) At 3/16" hole near center of plates insert 1/2W/AN3-21A/1/2W/S for limit stop.

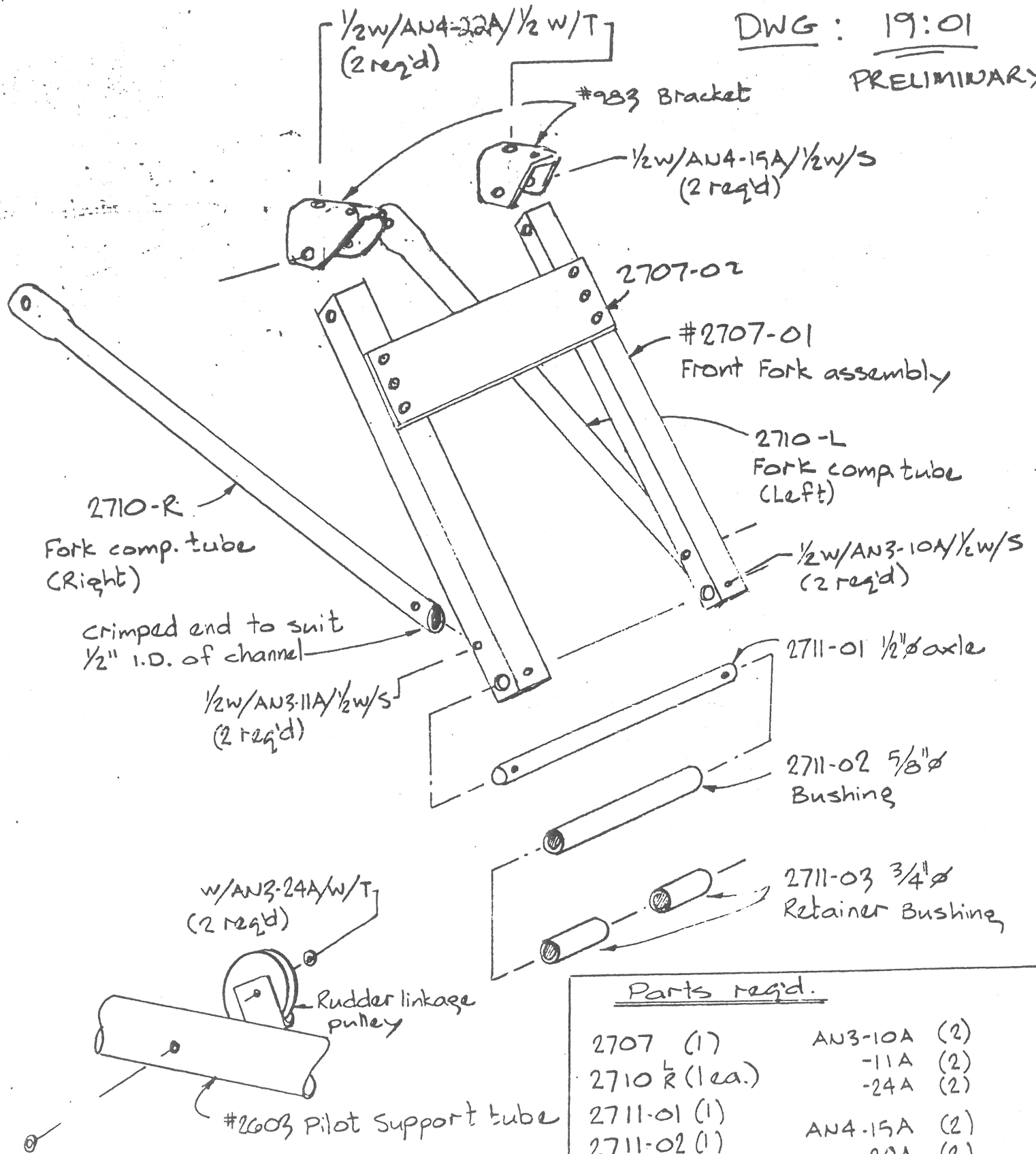
3.) Tail Wheel Installation;

a) Slide tail wheel assembly into bottom of tail post until tube butts against eye bolt. Drill 1/8" approx. 1/2" from bottom of tail post and secure with #8x 1/4" screw.

b) Cut 4 ft. of 1/4" bungee cord for rear wheel suspension. Wrap the bungee around the top bushing on the tail plates and up around tail post, over top of rear horiz. stab. struts. Provide four wraps with the bungee quite tight with the top of attachment in the up position.

DWG : 19:01

PRELIMINARY



Parts req'd.

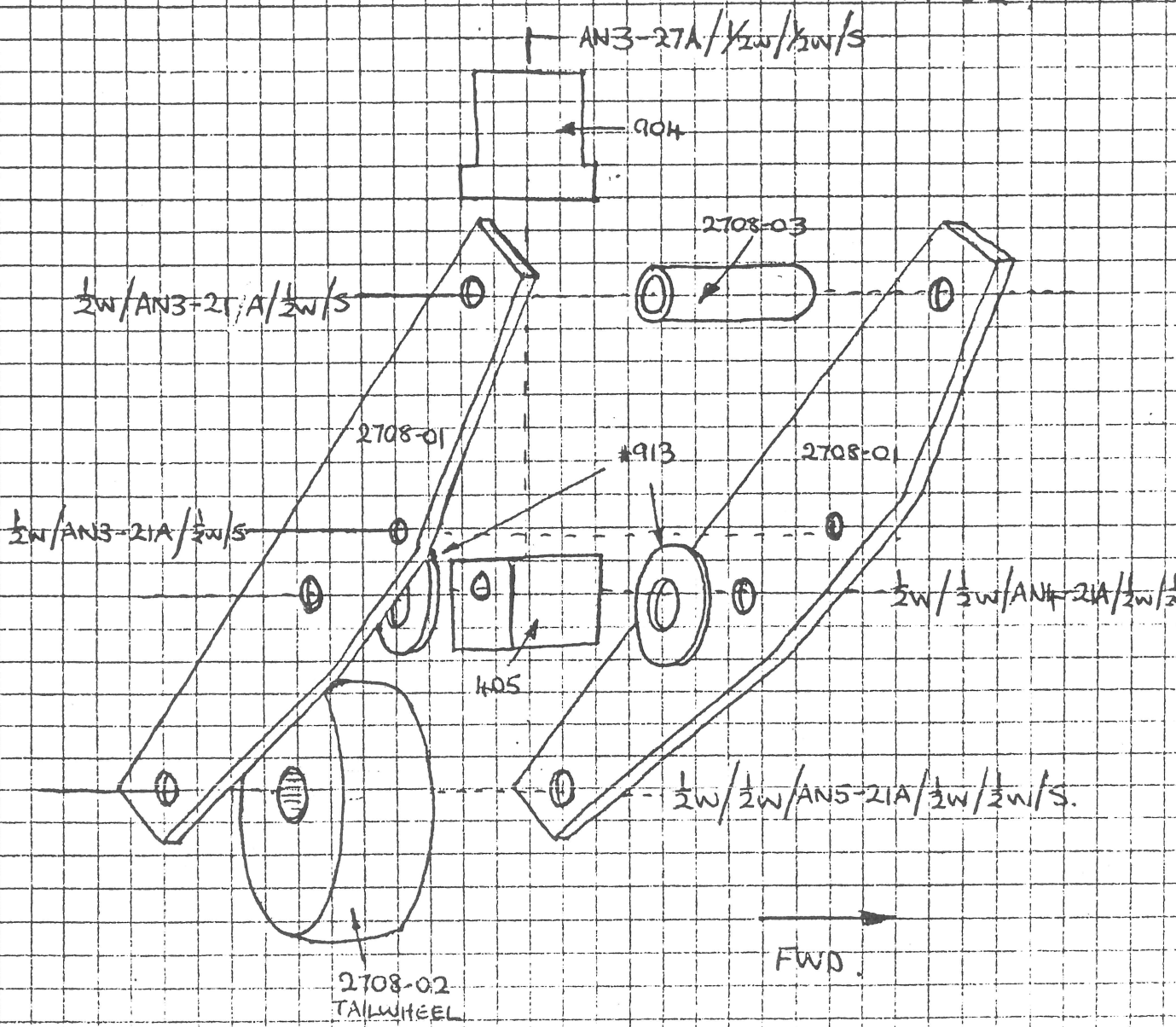
2707 (1)	AN3-10A (2)
2710 L (1 ea.)	-11A (2)
	-24A (2)
2711-01 (1)	AN4-15A (2)
2711-02 (1)	-22A (2)
2711-03 (2)	3/16" ϕ 1/2 w (8)
983 (2)	3/16" ϕ w (4)
	1/4" ϕ 1/2 w (8)
	3/16" ϕ S-nuts (4)
	3/16" ϕ T-nuts (2)
	1/4" ϕ S-nuts (2)

FRONT FORK ASSEMBLY

Dr. By: M. Dennis

DRAWING

19:02



TAIL WHEEL ASSEMBLY
(EXPLODED VIEW)

SECT.B STEP #20:

FAIRING/NON STEERABLE FRONT WHEEL/WINDSHIELD INSTALLATION

Parts Requirements

Part No.	Description	Qty. Req'd
523	Rubber Grommets	2
616	Fairing	1
2622	Windshield	1
2710	Fork Compression Tube	2

Bolt Requirements Qty.

AN3 π 11A	2
AN3 π 14A	2
AN3 π 17A	2
AN4 π 15A	2

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
S π	4	1/2 W π	10
T π	2	FW π	2
1/4"		1/4"	
S π	2	W π	4

Miscellaneous Qty.

#8 x 1/2" screw	8
Chrome bumper strip	6 ft.

SECT.B STEP #20:

FAIRING/NON STEERABLE FRONT WHEEL/WINDSHIELD INSTALLATION

1.) Fairing Installation

a) If the fairing is not marked for hole locations see dwg. 20:01 and locate hole positions. Create a center line mark down the centre inside of the fairing. It can be quite accurately located by carefully measuring across the inside of the contour for the stick clearance. From here using the coordinates from dwg.#20:01 measure from the inside front of the fairing and each side of the center line with a square.

b) Mark all of the cut lines with a pen or pencil and proceed to cut on the inside of the fairing. Rough cut using a jig saw or key hole saw and finish edges using a course file.

c) Remove axle from front fork assembly for fairing installation. Attach the forks to the brkt's under the front foot pedal plate with the X-plate on assembly forward. Use W/AN4-15A/W/S (two req'd)

d) Slide the fairing over the forks and locate holes for attachment to the down tubes. Gently lift up on both sides of the fairing, at the top corners where it is to attach to down tubes. Lift until there is only about 1/4" to 1/2" clearance between the fairing and each side of the front foot pedal plate assembly. Do not pull up so far as to touch at this point.

e) Pre-drill 1/8" holes through the fairing at each corner where it aligns with center of down tubes. Sight the fairing from the front for eveness and mark the down tubes at the hole locations. Measure the distances at each down tube for even setting, then drill through each tube without the fairing in place. Insert 1/2W/AN3-17A/1/2W/S through from the front to the rear with a #523 rubber washer between the tube and the fairing.

f) The sides of the fairing are to be bolted through the pilot side tubes 3" forward of the rear edge of the fairing with FW/AN3-14A/1/2W/T. (see dwg.20:01) CHECK that when positioning the fairing on the side tubes for bolting that there is about 1/4" clearance for side to side movement of the control stick. Providing for this clearance may alter drilling positions in the fairing and the side tubes.

g) Attach the chrome bumper strip around the side edges of the fairing. Some areas may require some finishing with a fine file.

2.) Completion of Front Wheel Installation

a) Install the #2710 Fork Compression Tubes with the flattened end to the under side of the control stick mount pl. (located under the pilot support tubes) and the bevelled end into the forks, using 1/2W/AN3-11A/1/2W/S. There may be a need to flatten the end more to allow the strut end to fit into the channel.

b) Install front axle, 5/8" bushing and #713 front wheel with 3/4" bushings each side of wheel hub. Re-insert and tighten axle retaining bolts.

3.) Windshield Installation

NOTE: The windshield is installed independant of the fairing and does not need to be attached to the fairing.

a) When attaching the windshield to the front down tubes there should be a bend in it all the way to the top of the windshield so that the curved shaped of the windshield provides strength to withstand high loading. To attain this bend it is easiest to tie 2 or 3 strings under tension around the windshield from the top to the bottom to pre-load the curve into the windshield. This will allow for accurate centering of the windshield relative to the down tubes. There may be some unequalness in the top of the fairing so do not trust the fairing as the ultimate reference to squaring up the windshield. The windshild should overlap the fairing about 3/4" so that it almost touches the fairing body after the dash contour.

b) With the windshield in place, measure and pre-mark all the screw hole positions. The first screw should go in about 3" above the bolt attachment for the fairing and three more up each side equally spaced up the windshield at about 8" spacings. Use #8 x1/2" screws.

You may notice that there is a space between the center of the windshield rim on the fairing and the windshield. Leave this space open for air flow, it is a natural defrost vent.

SECT.B STEP #21: WING INSTALLATION

Parts Requirements

Part No.	Description	Qty. Req'd
2022	Wing Strut	4
2026	Diagonal Jury Strut	2
2027	Leading Edge Jury Strut	2
2028	Trailing Edge Jury Strut	2
2029	Horizontal Jury Strut	2
2525	1-3/4" saddles x 5/16 hole	8
2908	Wing Strut Fitting	4
2936	1/8" Plastic Washer c/w 5/16"hole	2
2959	Jury Strut Clamp Bracket	4

Bolt Requirements	Qty.	AN Hardware	Qty.
AN3-10	2	AN393-17	4
AN3-7A	4	(clevis pin)	
AN3-10A	4	AN380-2-2	4
AN3-17A	12		
AN3-20A	4		
AN4-11	4		
AN4-24	2		
AN4-27	2		
AN5-26A	2		
AN5-30A	2		

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
S	24	1/2 W	36
C	2	W	24
1/4"		1/4"	
C	8	1/2 W	12
5/16"		5/16"	
T	4	W	8

Miscellaneous	Qty.
Safety pins	12

SECT.B STEP #21: WING INSTALLATION

1.) Wing Strut Preparation;

a) Install W/AN3-20A/W/S through 3/16" hole at end of #2022 wing struts. (one req'd per strut.)

b) Attach #2908 wing strut fittings to the attachment plates on the side strut X-bar, using W/AN4-11/W/C Safety Pin.

2.) Wing Attachment;

a) Installing the wings will require a little assistance, and a saw horse will help for the procedure.

b) Position the wing onto the keel and align the L/E spar to the front brkt. and the T/E spar to the rear brkt. At the front spar insert 1/2W/AN4-27/1/2W/Castle/Safety Pin through brkt. and L/E.

c) On the rear spar use 1/2W/AN4-24/1/2W/Castle/Safety Pin.

3.) Wing Strut Installation;

a) Attach the front struts to the L/E spar (solid plug end to wing) with #2525, 1-3/4" saddles each side of strut and #2936 spacer washer between the brkt. and the rear saddle. Use W/AN5-30A/W/T inserted from rear (finger tight only)

b) Attach the rear struts to the T/E spar using W/AN5-26A/W/T with #2525, 1-3/4" saddles on each side of strut. Insert bolt from front.

c) Once struts are attached to the wing, lift the wing and slide the other end of the strut over each of the wing strut fittings, at the fuselage.

d) Drill the wing strut ends for 3/16" bolts by following the drilling diagram in dwg.21:01. Note: All holes should be marked prior to drilling, and each hole drilled independently for accuracy. Once drilled each wing strut becomes an independant part and will only fit into its original position. (mark each for reference)

e) Secure each wing strut using 1/2W/AN3-17A/1/2W/S. (3 req'd per strut)

4.) Jury Strut Installation;

The jury struts are intended as a semi permanent installation and can be folded down for breakdown with disconnection of the two 3/16" clevis pins and one castle nut per side.

a) Attach the riveted end of #2027 leading edge jury strut to the wing-mounted plate on L/E spar using AN393-17 Clevis Pin/Safety Pin. Lower end of strut has 3/16" hole.

b) Attach #2028 trailing edge jury strut to the wing-mounted plate on T/E spar, using AN393-17 Clevis Pin/Safety Pin. There are 3/16" holes, both top and bottom of T/E jury.

5.) Locate Jury Clamp Brackets;

a) Rotate L/E & T/E jury struts until the 3/16" hole in end fitting is 5/8" from edge of wing strut. Use a ruler to measure this distance, keeping in mind that the wing strut must be kept straight, then mark onto the tube for reference. Measuring from end of wing strut the ref. mark should be from 62 3/4" to 63 1/4". Transfer the same measurement to the opposite wing strut.

b) Wrap black electricians tape over each wing strut centered on each reference mark. Attach #2959 jury clamp brkt's over the tape and clamp together using small vice-grips or needle nose pliers, while inserting into the slots in the jury struts. NOTE: be careful not to mark or damage the jury strut clamps when installing.

c) Align the holes in brkt. and struts then take a view from the front and align the front and rear jury's so that they are visually parallel.

Secure each with 1/2W/AN3-7A/1/2W/S (four req'd)

6.) Horizontal Jury Installation;

a) Attach #2029 Horizontal Jury Strut with the flat side to the inside bottom hole of the rear jury, installed with a 1/2W/AN3-10A/W/W/1/2W/S. The two thick washers go between the horizontal and the rear jury to allow for smooth folding of struts during breakdown for travel.

b) The opposite end is attached to the inside of the front jury. Take a look down the side struts and look for straightness of struts. As the horizontal jury is installed it will be necessary to account for slight bends in the wing struts and to set the jury so that it aligns and straightens the wing strut.

c) Trace drill 3/16" through L/E jury and through center of flat on forward end of horizontal strut. Temporarily pin the struts together.

7.) Diagonal Jury Installation;

a) Install #2026 Diagonal Jury Strut to the top outboard side of the rear jury strut using 1/2W/AN3-10A/WW/1/2W/S with two washers between the struts.

b) The diagonal and the horizontal jury's are both attached together at the front strut. With the horizontal strut in position, locate hole on diagonal strut through attachment hole on L/E jury, then drill 3/16".

c) Attach horiz. and diag. struts to L/E jury with 1/2W/AN3-10/1/2W/C/Cotter Pin and repeat for opposite side.

5.) Locate Jury Clamp Brackets;

a) Rotate L/E & T/E jury struts until the 3/16" hole in end fitting is 5/8" from edge of wing strut. Use a ruler to measure this distance, keeping in mind that the wing strut must be kept straight, then mark onto the tube for reference. Measuring from end of wing strut the ref. mark should be from 62 3/4" to 63 1/4". Transfer the same measurement to the opposite wing strut.

b) Wrap black electricians tape over each wing strut centered on each reference mark. Attach #2959 jury clamp brkt's over the tape and clamp together using small vice-grips or needle nose pliers, while inserting into the slots in the jury struts. NOTE: be careful not to mark or damage the jury strut clamps when installing.

c) Align the holes in brkt. and struts then take a view from the front and align the front and rear jury's so that they are visually parallel.

Secure each with 1/2W/AN3-7A/1/2W/S (four req'd)

6.) Horizontal Jury Installation;

a) Attach #2029 Horizontal Jury Strut with the flat side to the inside bottom hole of the rear jury, installed with a 1/2W/AN3-10A/W/W/1/2W/S. The two thick washers go between the horizontal and the rear jury to allow for smooth folding of struts during breakdown for travel.

b) The opposite end is attached to the inside of the front jury. Take a look down the side struts and look for straightness of struts. As the horizontal jury is installed it will be necessary to account for slight bends in the wing struts and to set the jury so that it aligns and straightens the wing strut.

c) Trace drill 3/16" through L/E jury and through center of flat on forward end of horizontal strut. Temporarily pin the struts together.

7.) Diagonal Jury Installation;

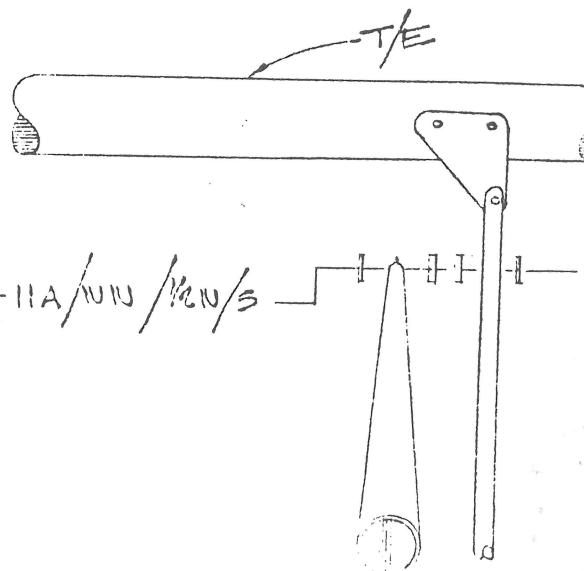
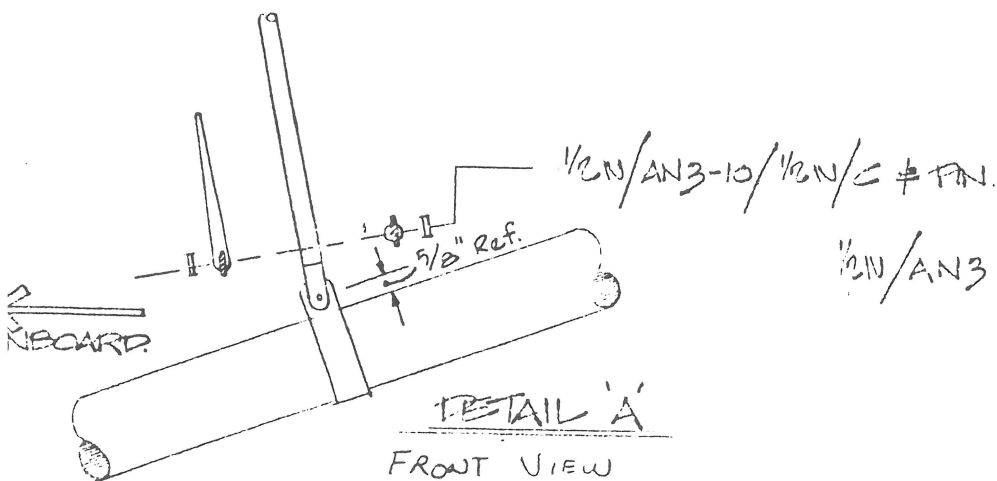
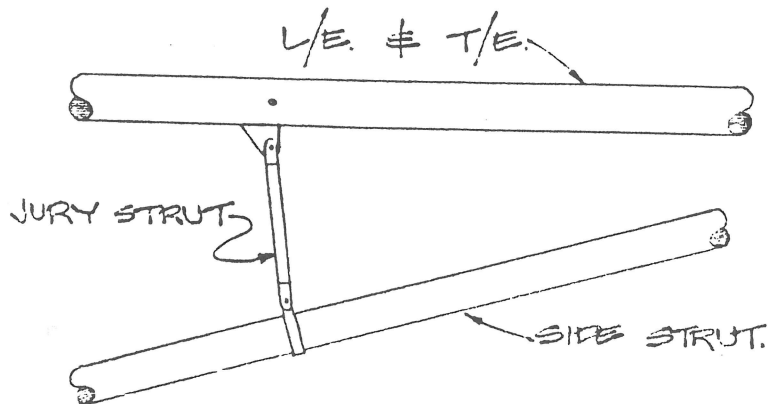
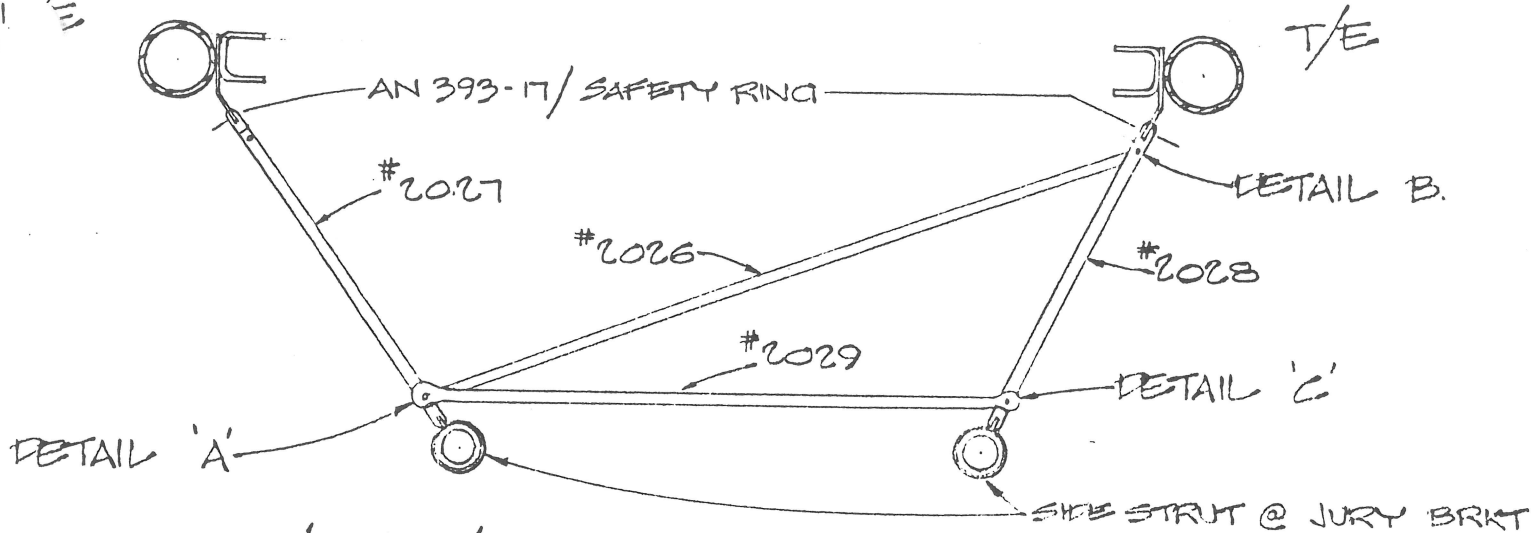
a) Install #2026 Diagonal Jury Strut to the top outboard side of the rear jury strut using 1/2W/AN3-10A/W/W/1/2W/S with two washers between the struts.

b) The diagonal and the horizontal jury's are both attached together at the front strut. With the horizontal strut in position, locate hole on diagonal strut through attachment hole on L/E jury, then drill 3/16".

c) Attach horiz. and diag. struts to L/E jury with 1/2W/AN3-10/1/2W/C/Cotter Pin and repeat for opposite side.

JURY STRUT INSTALLATION DWG. 21:01.

VIEW LOOKING INBOARD

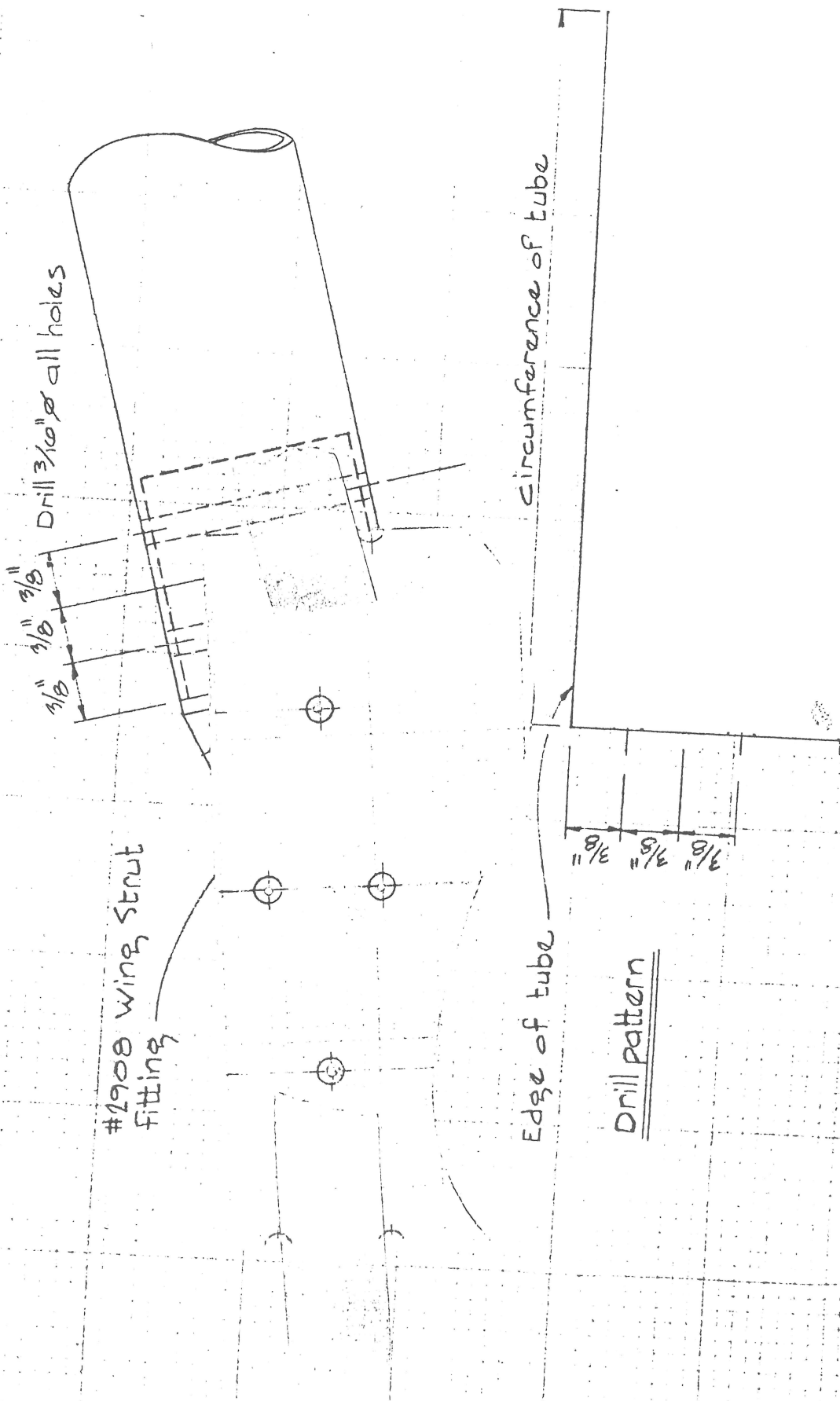


DETAIL 'S'

FRONT VIEW



2 X 550 ASSEMBLY STEP 11-21



SECT.B STEP #22: AILERON LINKAGE & INSTALLATION

Parts Requirements;

Part No.	Description	Qty. Req'd
2009-03	Compression Strut Double Tube	2
2419	Push Rod	2
2423	Bushings	4
2424	Rod End (Female)	2
2432-01	Bellcrank	2
2432-02	Bellcrank Bearing	2
2432-03	Horn Shim Plate	2
2433 L/R	Main Aileron Cables	1 ea.
2434	Internal Control Cables	4
2435	Balance Cable Link	1
914	Pulley Bushings	7
2944	2" Diameter Pulleys	7
2996	Pulley Plates	2 @ 4ea.
2997	2" Diameter Pulley Guards	3

Bolt Requirements	Qty.	AN Hardware	Qty.
AN3-5	4	AN42B-16A	4
AN3-6	3	(eye bolt)	
AN3-7	4	AN390-2-2	14
AN3-7A	8	(cotter pins)	
AN3-23A	8		
AN3-30A	1		
AN3-34A	1		
AN4-13A	2		
AN4-23A	2		

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
S	16	1/2 W	72
T	6	W	41
C	11		
1/4"		1/4"	
S	2	1/2 W	8
T	4	W	8

Miscellaneous	Qty.
1/8"x 1/4" grip SS rivet	12
3/16"x 1/4" grip SS rivet	4
Large Nylon Tie Wraps	6
SS Safety wire	8 ft.

SECT.B STEP #22: AILERON INSTALLATION

1.) Internal Wing Preparation;

Attach #2009-03 compression strut doubler to Stn.No.2 compression strut in wing. The doubler is installed to inboard side of compression strut with 1/2W/AN3-23A/1/2W/S inserted from outboard side. Repeat for opposite wing.

2.) Bellcrank Assembly;

a) Attach #2432-02 bellcrank bearing onto #2432-01 bellcrank plate. (see dwg.22:01) NOTE: There is a left and right bellcrank req'd. Mount the bearing to the underside of the plates with all rivets inserted from top. Position bearings into large holes in bellcrank plates and trace drill 'six' 1/8" holes evenly spaced around bearing.

b) CHECK that bearings are mounted to opposite sides from each plate to create a left and a right. Insert 1/8"x 1/4" grip SS rivets through plate, then through bearing. The rivets should leave a little more than 1/16" showing through the other side after they have been set.

c) Pre-drill #2432-03 bellcrank shim plate as specified in dwg.22:01.

3.) Bellcrank Installation;

a) Identify left and right bellcrank and install to top side of Stn.2 compression strut as shown in dwg.22:02. Insert 1/2W/W/AN4-23A/1/2W/T through bellcrank (bearing to underside) and 1/4" hole in shim plate with a washer between bearing and plate, then attach to 1/4" hole at center of stn.2 compression strut.

b) When tightening bolt rotate the shim plate so the rivet holes are towards the root, over the compression strut doubler. Tighten this bolt down firmly to about 80 in. lbs. without crushing the tube.

c) Position the shim pl.square over the doubler tube and trace drill 3/16" through holes in plate. Slide a 3/16" Washer between comp.strut doubler and shim pl. and set with 3/16"x 1/4" grip SS rivet.(two req'd)

d) Attach #2424 rod end to the 1/4" hole in each of the bellcrank plates. The rod end is attached under the bellcrank, between #2423 brass bushings on each side for spacing. (see dwg.22:03) Insert 1/2W/W/AN4-13A/1/2W/T from top with a 1/2 Washer each end of bolt, and between top bushing under plate. Tighten this nut up snug to 80 in. lbs. There should not be any slack in this bolt!

e) RE-CHECK dwg.#22:08 for proper installation of bellcranks. Rod end should be outboard of compression strut.

4.) Internal Cable Attachments;

Attach the tang end of the four #2434 internal wing cables (two per side) to the top of each bellcrank. Use 1/2W/1/2W/AN3-5/W/C/Cotter Pin inserted from top with a 1/2 washer each side of tang then through bushed holes in bellcrank. Use a 3/16" reaming tool if holes are tight, then finger tighten castle nut for proper installation of cotter

pin. (see assembly procedures) There must be at least 1/8" clearance between the bolt end and the compression strut.

5.) Pulley Attachments on Down Tubes;

Insert W/W/AN42B-16A/W/T (4 req'd) through the 3/16" holes at the top and bottom of the front downtubes. Position with eye inboard at bottom, and the eye to the rear at the top, with two washers on the eye of the bolt and one washer at the nut end. These bolts should be tightened fairly snug to prevent loosening due to vibration.

6.) Pulley Attachments on Keel;

Check for the 3/16" hole positions on keel for placement of pulleys.(see dwg.22:03 detail 'B') They should be positioned at 32-7/8" and 37-1/8" from the front of the keel. If the holes are not factory drilled, you will be required to locate them.

NOTE: Drill the top and the bottom holes independently. ie; Locate the top hole position on center of keel then use a square to transcribe a line around to the bottom, and locate opposite hole on center. Use a center punch to properly locate holes.

7.) Pulley Assemblies;

a) Prepare all pulleys for installation by inserting #914 brass bushing, into each of the seven #2944, 2"dia. pulleys. The pulley rotates around the bushing and should rotate freely when installed. If it is tight or stiff to turn, the pulley will require drilling or reaming. Use letter 'O' or 'P' drill (8.2mm)

b) Prepare #2996 pulley plates for installation.(see dwg.22:04) The plates will require cutting and filing for proper fit, two required at each of the four eye bolts. Cut the corners off one end of each plate and file all edges round.NOTE: Check that hole clearance is 3/16"min. from edge of hole to edge of plate.

c) Attach two plates to each eyebolt with two 3/16" washers and one 1/2W on each side of the eye between plates. Use 1/2W/1/2W/W/W/AN3-7A/W/W/1/2W/1/2W/S. NOTE: Check that pulley plates can rotate on eye without binding on downtubes.

d) Install one of the pulleys to the forward 3/16" hole on top of the keel.(see dwg.22:06) Place #2435 balance cable link around pulley with #2997 pulley guard over the cable, then position assembly onto keel with cable towards rear. Use 1/2W/AN3-30A/W/W/1/2W/T with two washers under the pulley to shim balance cable between the two main cables.Finger tighten only.

e) For easy reference when installing control cables, temporarily install two of the pulleys to the rear 3/16" hole on top of the keel. Attach #2997 pulley guard over each pulley and bushing. Insert 1/2W/AN3-34A/1/2W/W/T through each pulley with a 1/2 washer at head of bolt and between bottom pulley and keel with also a washer under the keel. Finger tighten only.

8.) Control Cable Routing;

a) Attach #2433-01 aileron control cables to the horn on the control torque arm as shown in dwg.22:04. There is one main cable with a short puller tube on it for pulling tension on the cables when assembling or disassembling the aircraft for transport. Attach the cable, with the puller tube on the tang side of the 24" nylon sleeve, to the port side of the aircraft.

b) Attach both cables, one to each side of the torque arm horn using W/AN3-6/W/C/Cotter Pin inserted from rear. The pulling cable should be attached to front.

c) Position the cables around the pulleys and attach to the plates mounted at the downtubes, with the nylon sleeve above the pulley location. Use 1/2W/AN3-7A/1/2W/S. NOTE: The eyebolts may require turning for best alignment of cable routing.

d) Position the pulleys at the top eye bolt locations in the same manner as detailed in previous step, with nylon sleeving between upper and lower pulleys.

e) Route the left cable back and install around either top or bottom pulley at keel, then route the right cable back and around the other pulley. When reinstalling the pulleys, be sure that the cable guard is over the cable. (see dwg.22:06 & 22:07)

f) Secure the nylon tubing to the front downtubes using three nylon tie straps at each side. (cut ends off tie straps once cables are set properly)

9.) Control Linkage Connection;

a) Connect the balance cable link to the turnbuckle on the forward internal cable with AN393-9 Clevis Pin/Cotter Pin at each side.

b) Connect the control cable from port side to the starboard rear internal cable on wing. Attach the tang to the turnbuckle using AN393-9/Cotter Pin/Clevis Pin.

c) Connect the control cable from starboard side to port rear internal cable on wing with same.

10.) Cable Setting

With all of the cable linkages connected, the bellcrank will require squaring to the internal wing cables. (see dwg.22:08)

NOTE: New cables will always take an initial set which can stretch an appreciable amount in its initial use, so it is advisable to prestress the cables prior to any adjustments. This is done by pulling fore and aft by hand in the center section of the wire bays with moderate pressure, then taking up slack with the turnbuckles.

11.) Cable Tension;

The cables should be tightened to achieve about a 10lb. side pull with a 1" to 1-1/4" deflection in each of the internal wing cables. You will be able to feel the differences that cable tension changes make, on the force needed to move the stick.

Due to aerodynamic forces on the ailerons, the balance cable running between each aileron is under greater loads than the control cable running from the control stick. This relieves pressure slightly on the pulleys which actually decreases stick pressure in flight.

12.) Cable Alignment;

a) Tie the control stick, in an accurate center position for proper squaring of the bellcranks.

b) The internal wing cables are to be aligned at 90 degrees to the bellcrank assembly. Use a square to check cables while adjustments are made, and align the center of each cable attachment bolt on bellcrank, square to each cable.

TIP: A good method to adjust the bellcranks is to approximate the squareness quickly, keeping the wires at a proper tension. As one wire needs loosening to change the angle, then it is important to tighten the other turnbuckle beside it the same amount. Doing this for each wing will insure that the adjustments made to one side won't affect the opposite wing. After making adjustments to one side, it is important to always check the opposite side.

13.) Post Assembly;

Once all cables are properly aligned, lockwire each of the four turnbuckles. (see assembly procedures) CHECK ALL attachment points on the system, especially where cotter pins are requested, as well as all pulley attachments and cable guards.

14) Aileron Installation;

a) Attach each aileron to the trailing edge spar with the control horn down, at the inboard hinge location. Attach each of the end hinge points using 1/2W/AN3-7/1/2W/C/Cotter Pin. It is not necessary to secure the cotter pins at this point as the ailerons require removal for fabric covering.

b) For reference, secure the mid hinge point to the eye bolt attached to T/E spar with W/AN3-6/W/C/Cotter Pin. NOTE: 1/2W can be used in place of full washers if required.

15.) Aileron Adjustment;

a) Install a 1/4" shear nut onto male fitting end of #2419 push rod, to be used as a backing nut for the rod end. (thread nut on all the way)

b) Check that the control stick is centered, and thread the push rod into the rod end attached to the bellcrank. Temporarily pin the opposite end of the push rod onto the aileron horn, using 1/2W/AN393417 Clevis Pin/1/2W/Cotter Pin. The aileron horn may require a slight bend near where the push rod is attached for proper alignment. A crescent wrench will work well for this.

c) Use a straight edge (broom stick etc.) placed under the L/E and T/E wing spars to measure aileron droop. (see dwg.22:09) Adjust the push rod by disattaching from the horn and threading in or out of the rod end to achieve within a max. 1/8" tolerance, the required 2" of droop.

d) With both ailerons set, reinstall the clevis pin for the aileron horn and tighten the backing nut against the rod end at bellcrank.

IMPORTANT:

The absolute minimum amount of the thread required inside #2424 rod end is 3/8", with a backing nut to lock up against the rod end.

16.) INSTALLATION CHECK:

- * Check for smooth operation of aileron movement.
- * LEFT BANK = Left aileron UP ; Right aileron DOWN.
- * RIGHT BANK = Right aileron UP ; Left aileron DOWN.
- * Check for sticking pulleys.

NOTES

ADJUSTING AILERONS:

In the future if there is any adjustment necessary after flying, the #2419 may be taken out and re-installed with the stop nut pre-turned as far as needed either way in 180 degree intervals. This is for when threaded back into rod end, the push rod comes back to a positive stop and is in line with the aileron horn. Always check thread distance beyond backing nut for min.thread grip.

BREAK DOWN AND SET UP OF AILERONS FOR TRAILERING:

To disconnect aileron cables for wing disassembly, relieve tension on the cables by disconnecting the cable at the control torque arm under seat. Remove the cable with the pull tube attached, which should be located at front of horn. This will unload all tension in the system and make it easy to remove the pins at the internal wing cables on each side of the keel.

Never re-use the same cotter pins. There is to be a new cotter pin installed each time a cotter pin is removed. For the most frequently disassembled areas use a safety pin or, for critical control links or areas close to the ground, use safety rings.

When disassembling the aircraft it is a good idea to attach a string to the internal wing cables and tie it around the station 1 compression strut to keep the wires easily accessible. DO NOT leave the string attached when attempting to fly the aircraft - it could cause binding of the cables.

LONG TERM CABLE TENSION ADJUSTMENT:

Cables will always stretch under load over a period of time. The shorter the cable is of course the less it will stretch. In level flight most of the flight loads are taken up by the balance cable which is the shortest link in the system.

There will be 2 very evident signs of cable stretch due to normal wear.

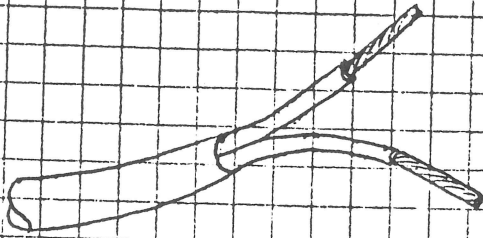
1. The ailerons will trim up slightly higher than normal (about 1/2").
2. The main aileron cables which run down along the front down tubes will feel looser in flight than when originally installed.

If there is evident cable stretch without elongation of the thimbles it is quite acceptable to tighten up the turnbuckles to increase tension.

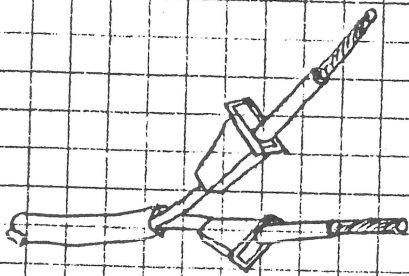
To check for cable wear inspect all of the thimbles for stretching out of round and inspect cables especially around turn points through pulleys and areas susceptible to damage caused by foreign objects. Use a soft cloth to detect any frays which may develop.

IGNITION CABLE END PREPARATION

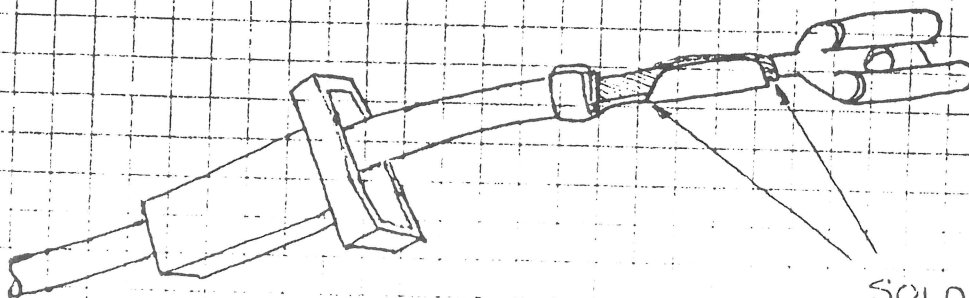
A) EXPOSE CABLE ENDS



B) SLIDE ON PLASTIC WEATHER PROTECTORS

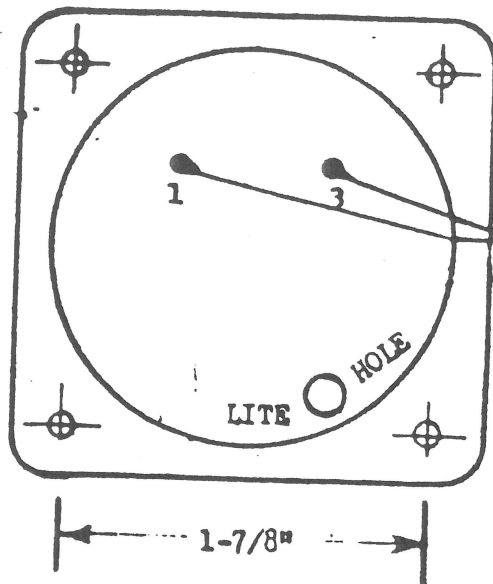


C) FIT AND CLAMP END FITTING (ONE ONLY SHOWN FOR CLARITY)

SOLDER IN THESE
LOCATIONS

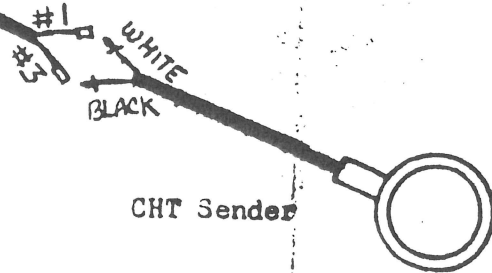
INSTRUCTIONS

CYLINDER HEAD TEMPERATURE



NOTE - Non TSO Kit:

The components of this kit are not certified under TSO or STC. Check with your installer for applicability of FAA Form 337 when installation is to be accomplished on type certified aircraft.



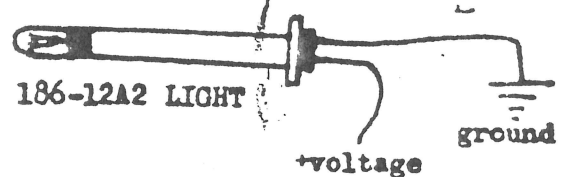
Mount the ring sender under spark plug. The gasket is usually removed. Do this on the leanest cylinder as defined by engine mfr. Leanest cylinder will vary with engine and carburetor setups.

Mount the instrument in 2-1/16" hole for front panel mount (2 1/4" hole for behind panel mount) in convenient operating place. Use diagram for mounting template. Connect instrument as shown. Connect pin terminal #1 to white sender lead. Connect pin terminal #3 to black sender lead. Patch cable can be omitted or lengthened 4 feet without affecting accuracy of instrument. To lengthen use 18 gage wire. NOTE: If no reading, reverse sender leads.

LIGHTED INSTRUMENT:

1. Remove lite hole cover
2. Insert light, snug fit only!
3. For off-on control, wire one lead to ground other lead to ignition switch (light dimmer)
4. For continuous operation, wire one lead to ground other lead to +12 volt battery

NOTE: When used on 24 volt, order 24 volt adapter Cat. #329-24.



Route wires away from hot manifold and pipes. Tie to other wire bundles, if available, and support wires every 12-15" intervals. Use grommets when going through metal.

WESTACH INSTRUMENTS are made with the highest quality material and workmanship. With reasonable care, instruments should give long and satisfactory service.

WESTACH INSTRUMENTS are guaranteed against defective material and workmanship for 1 year of service or 18 months from manufacturing date. Our obligation is limited to correct and return instruments prepaid and covers no liability for damage from shipment, improper installation, rough handling or if opened. UNDER NO CIRCUMSTANCES WILL WESTBERG MFG. INC. REIMBURSE CUSTOMER FOR COST(S) INCURRED IN REMOVING AND/OR REINSTALLING REPLACEMENT PARTS.

WESTBERG MFG. INC., 3400 WESTACH WAY, SONOMA, CA 95476 - PHONE #(707) 938-2121

Date. January 3, 1986

Advisory #030

Construction and Maintenance Advisory.

Compliance Priority: None.

Effective Date: Immediate.

Units Affected: All Operators, General Information.

Subject: Use of Synthetic Oils.

In advisory #029 the statement was made "Do not use pure synthetic oil". Spectrum Aircraft Inc. would like to retract that statement. Some synthetic oils could be acceptable.

All operators are reminded that the engine manufacturer's recommendation on oil, as stated in the operators manual, is as follows:

" Oil which is designed for severe service in 2 cycle air cooled engines at mixture ratios of 50 : 1 or greater with emphasis on low carbon production. Such oils meet or exceed B.I.A. or T.C.W. specification."

Synthetic oils which meet or exceed the above specifications are considered acceptable.

Spectrum Aircraft would like to apologize to any companies or individuals who felt that our statement restricted their ability of free trade.

ADV
017TT.TYT

ADVISORY #017 MAY 29, 1985

PRIORITY CLASS III (Optional) Construction & Maintenance
Advisory

UNITS AFFECTED: All RX-550 & RX-28 MODELS

SUBJECT; #019 Tip Tension Strut Assembly

Due to allowable tolerances during production and construction of the RX-28 and RX-550 aircraft, the situation sometimes occurs whereby the #019 Tip tension strut assembly, is in fact too long, and is over tensioning the sail and inducing wrinkles in the tip area of the sail. If, when pulling the #019 into the set position, the tip sail appears to go beyond the point where the most wrinkles have been removed, then this could be the case.

Action: It is permissible to shorten the #019 assembly by trimming material off the squashed end of the #019-02 tube where it plugs into the #979 Tip tension tang on the Leading Edge of the wing.

Caution: A small change in the length of the #019 can have a dramatic effect on the sail therefore.

(a) DO NOT trim any more than 1/8" from the #019-02 without checking the assembly in the wing.

(b) DO NOT assume that both wings will be the same. Check and adjust each wing individually.

Advisory #028.

Aircraft Optimization and General Technical Information.

September 23, 1985.

As a result of information recieved from operators and constructors of Spectrum products and as a result of a major overhaul carried out on an RX-550 with 590hrs Time Since New the following techical highlights have been compiled.

- 1). As a result of turning the rudder horns to clear the horizontal stabiliser struts there has been a problem on tailwheel equipped aircraft with the tailwheel side plates contacting the underside of the rudder horns and restricting free movement of the rudder. This can be remedied by placing AN970-4 washers between the #902 plug and the #504 swivel block. Only use the minimum number of washers required to gain clearance. Increase the length of the 1/4" bolt by 1 dash number for every 2 washers installed.
- 2). Additional security can be gained on the landing gear by using 2 #505 stainless steel tangs on each end of the #2705 drag struts. This provides back-up in the event of failure of the tang. It does not double the strength of the joints but provides additional protection for the aircraft, occupants and the parachute.
- 3). All seat belts and seat belt attachment hardware should be replaced after any major accident, etc. and should be replaced after 500hrs in service as a matter of course.
- 4). The #2994 front seat mounting brackets have, on training aircraft in particular, been found to be collapsing into the #2436 control stick connector pushrod. All operators are advised to monitor the condition of the #2994 bracket and replace it before it can contact and interfere with the pushrod.
- 5). There has been much discussion on the use of composite "fan" propellers on the RX-550. Experience has shown that fans, such as the Ultra-Prop and the Orion work much better if the reduction drive is rotated so that the centre of the prop is above the trailing edge of the wing. Performance does not equal that of the wooden propeller but for floatplane applications the composite props will last longer. Remember when selecting a fan that fans are only capable of absorbing 10-12 horsepower per blade. Therefore a 377 will require a 3 bladed prop, a 447 will require a 4 blade, etc.

6).When requesting warranty action the following information must be provided before any action can take place:

For Engines: Engine Type
Serial No
Purchase Date
Hours in Service

For Aircraft Parts: Aircraft Type
Serial No
Purchase Date
Hours in Service
Approx number of Landings

7). When mounting the 8.5 US gallon seat tank on the RX 550 the following modification can be made to improve visability and decrease reach to the pedals. Shorter pilots have found this change very beneficial. Basically the change involves raising the rear seat mount approx. 1-1/2" and providing a new fuel tank support on the motor post downtube. (See diagram 1).

To raise the seatmount use a length of 1-1/2" x 1-1/2" square tubing, 8" long with 1/4" holes drilled 1/2" in from each end. The holes will therefore be 7" apart and will match the pre-drilled holes in the #2625 mount bracket. Attach the seat to the #2625 with FW/AN4-25A/W/T sandwiching a #523 rubber washer between the seat and the new spacer assembly. (See diagram 2). Nylon or aluminium block spacers will work instead of the square bar.

A new fuel tank support will need to be fabricated from a length of angle stock. The support should be at least 3" long. Place a piece of rubber on top of the support to protect the seat-tank. Position the support so that 3/8" clearance exists between the seat-tank and the support with no load on the seat. Drill 3/16" and attach the support to the motor post with 1/2W/AN3-17A/1/2W/S (2 reqd.). (See diagram 2).

8). The release of the RX-45FE has prompted many inquires regarding the use of the Rotax 447 engine on single seater land planes. Experience has shown that the 447 does an excellent job of maintaining an acceptable level of performance on floatplanes, however, on land planes it appears that the 447 overpowers the airframe and the only change seems to be in the fuel consumption, which increases. Light weight pilots will notice an improvement in climb performance. The 447 engine is available on new aircraft on special order only.

9). All operators are reminded that the RX-550 must be flown solo from the front seat. The minimum front pilot weight when the aircraft is being flown by 2 people is 120lbs. Any parachutists must be carried in the rear seat. The aircraft becomes dangerously unstable and cannot be flown solo from the rear seat.

10). In order to increase the integrity of the side strut attachments to the wing spars, drill #11 through the strut end 90 degrees from the bolt currently installed and attach with 3/8 x 3/16 SS Rivets (See diagram 4).

11). On aircraft with the Second Chantz parachute mounted to the left hand side yaw strut. There is the possibility that the weight of the parachute could place an adverse load on the rivets holding yaw strut bracket to the fuselage tube, in the event of a hard landing. By fabricating and installing a support gusset plate as detailed in diagram 4 the possibility of damage to the aircraft structure could be minimized. The material suggested is 1/16" aluminium attached with 3/16" x 3/8" SS Rivets.

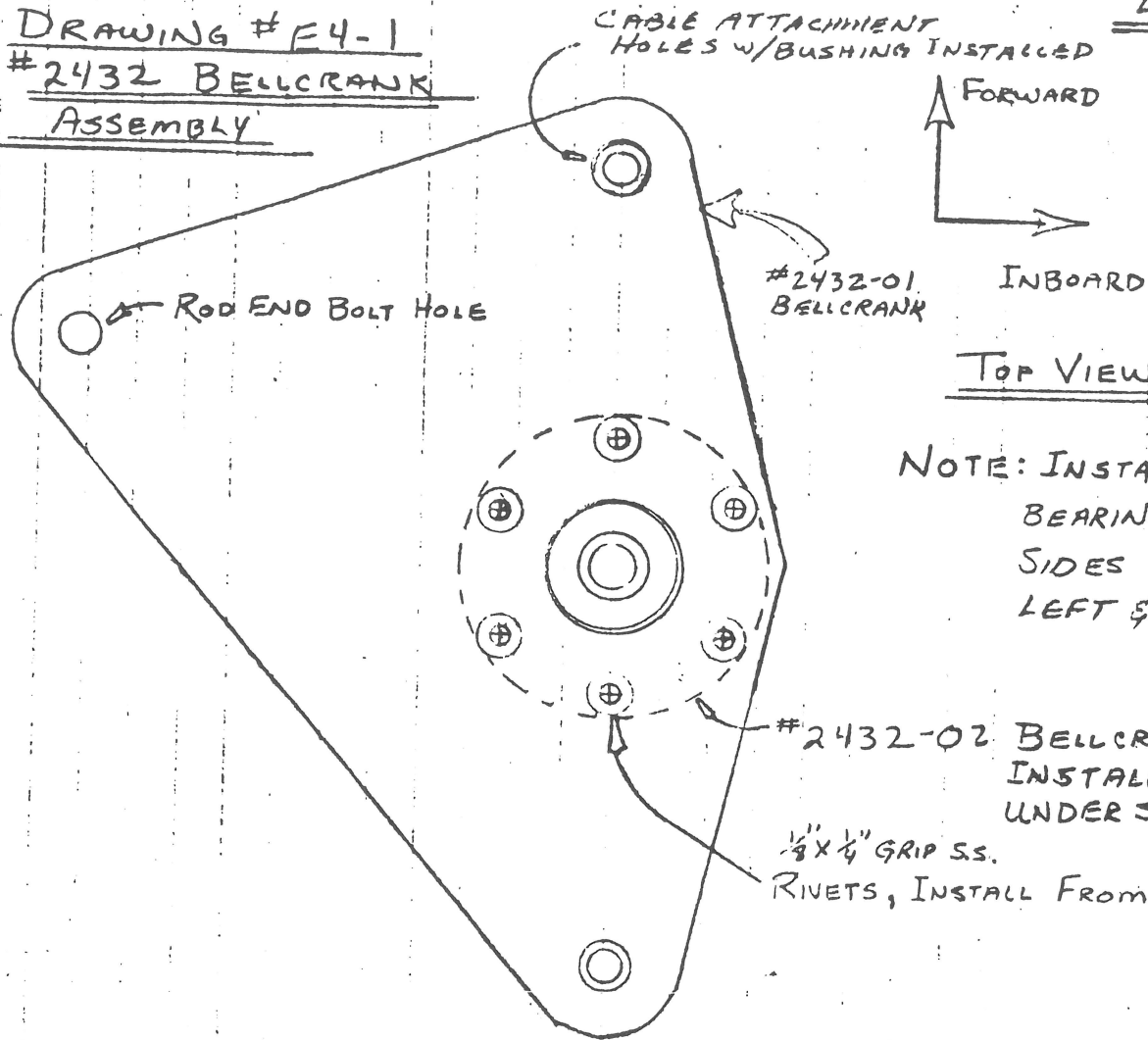
The information on the seat tank mounting and the parachute gusset is provided for interest sake only. Spectrum Aircraft does not manufacture any of the special parts mentioned.

Any feedback recieved from builders and operators with regard to modifications and improvements, as well as any problems encountered, which can be used for the benefit of us all would be greatly appreciated. The information can be used to improve assembly manuals and production quality control as well as being passed on to other operators through the medium of company advisories and newsletters.

My thanks to Gerry Wilson of Ultralights Unlimited for his assistance in the past in this regard.

22:01

DRAWING # F4-1
#2432 BELLCRANK
ASSEMBLY

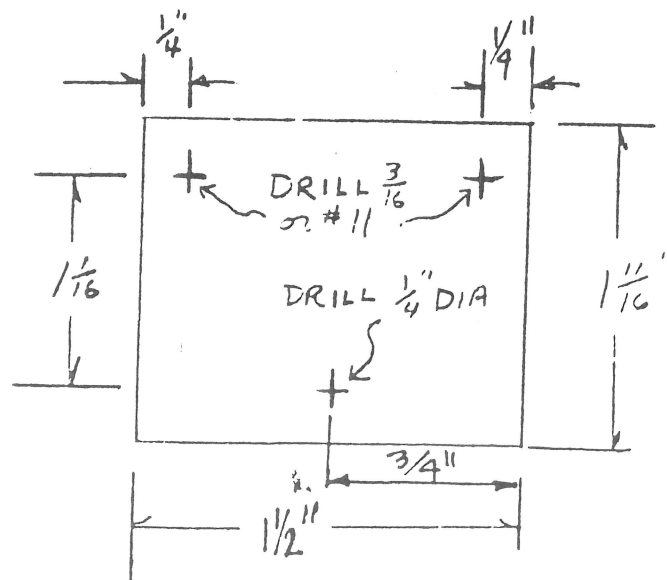


NOTE: INSTALL BELLCRANK BEARING ON OPPOSITE SIDES TO CREATE LEFT & RIGHT SIDE.

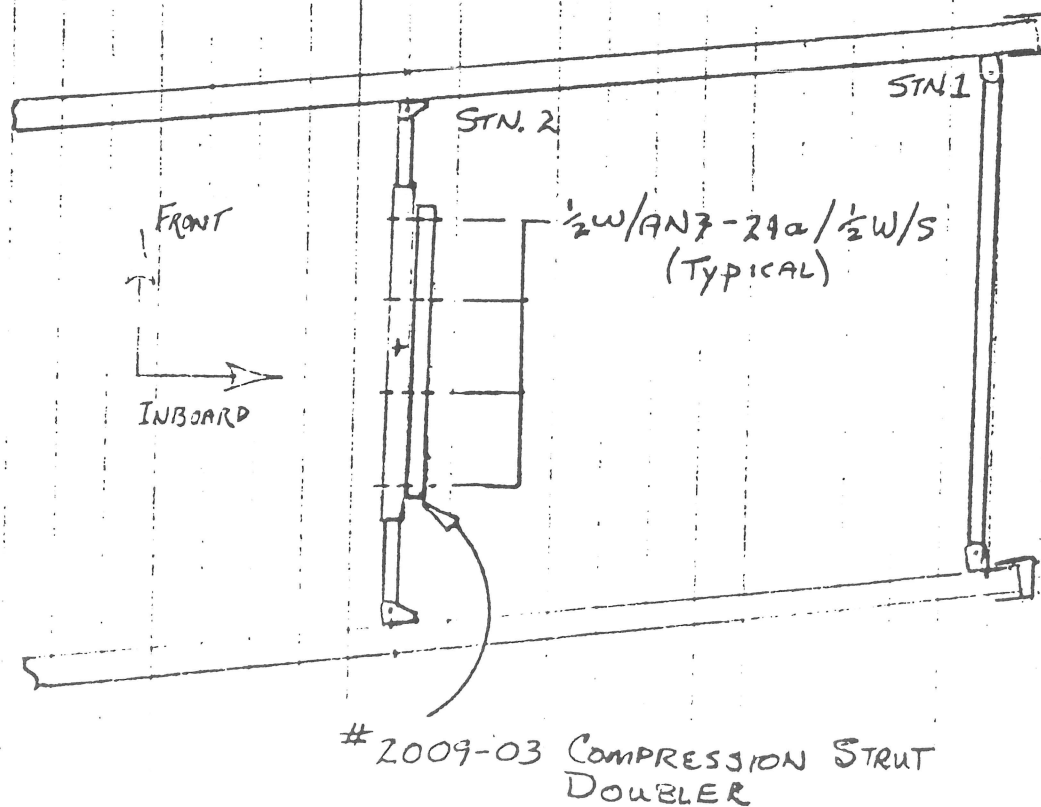
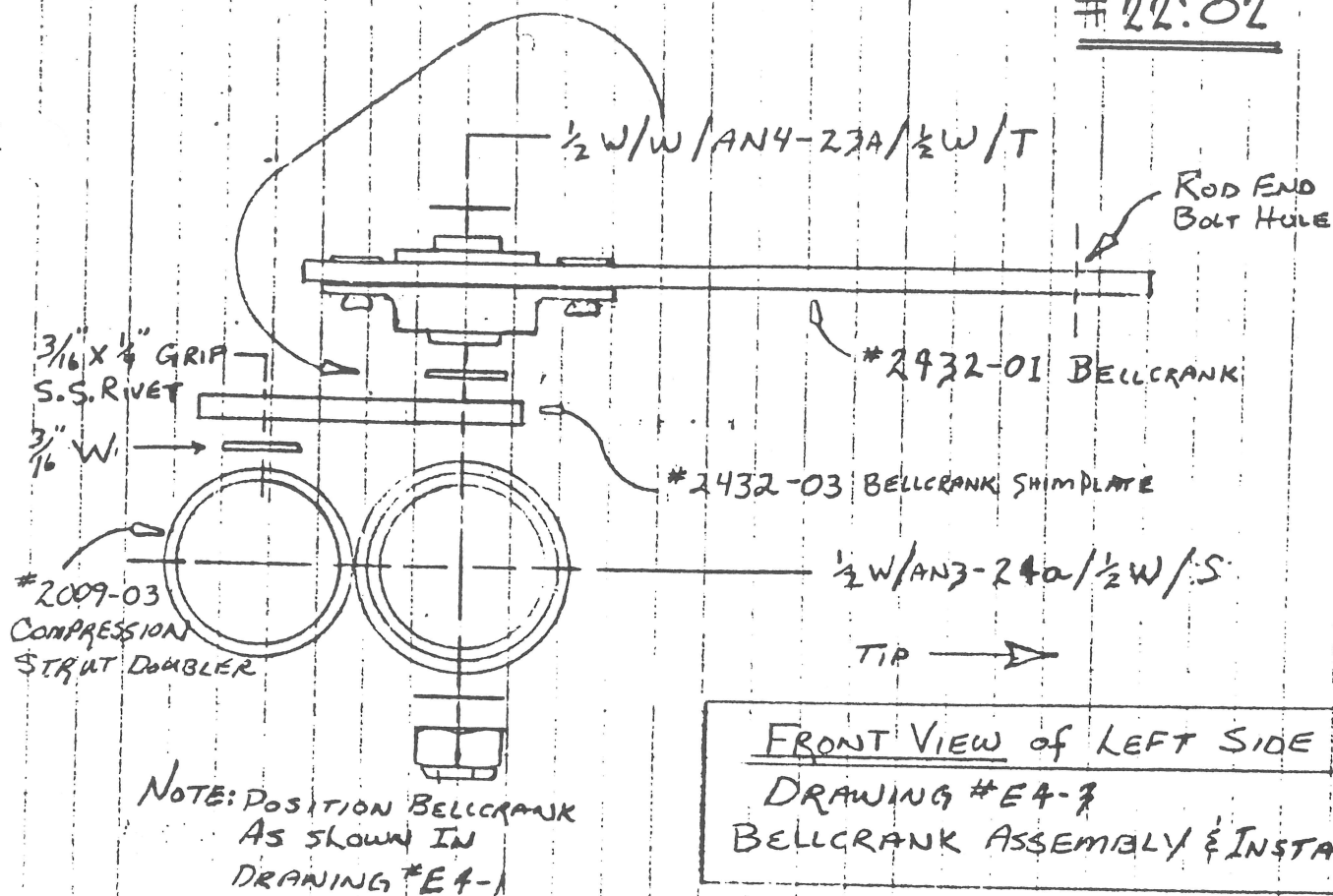
1/8 x 1/4" GRIP SS. RIVETS, INSTALL FROM TOP

#2432-03/BELLCRANK SHIM PLATE PREP FOR INSTALLATION.
 - PRE-DRILL 1/4" & 3/16" HOLES

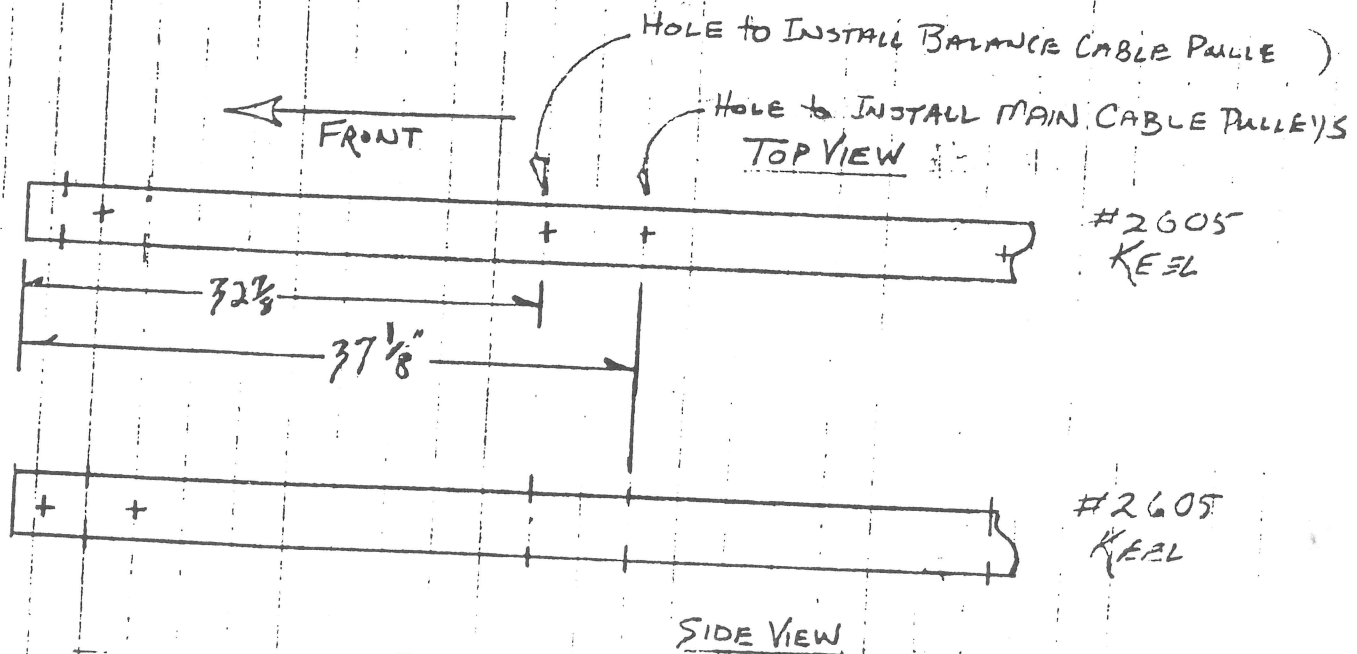
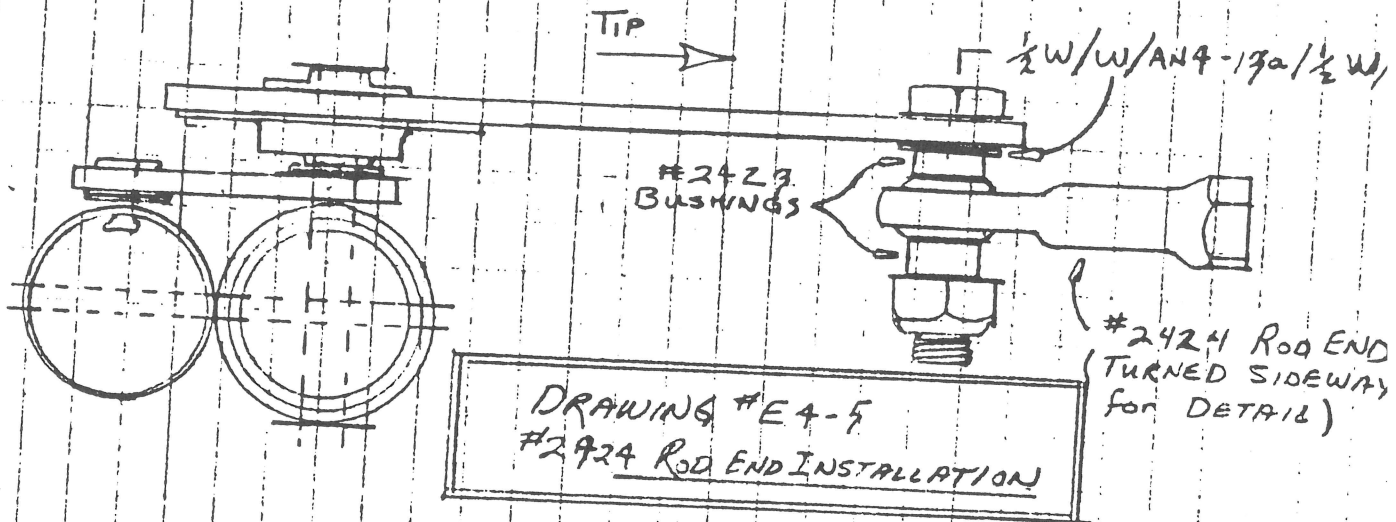
DRAWING # E4-2



#22:02



#22:03



DRAWING #E4-6
HOLE LOCATION IN KEEL FOR PULLEYS
INSTALLATION

#22:04

w/AN425-16A/w/T

FRONT
DOWN TUBE

DRAWING #E4-7
FRONT DOWN TUBE
BOTTOM INSTALLATION
OF EYE BOLT & CABLE.

TOP VIEW

w/AN3-6/w/c-

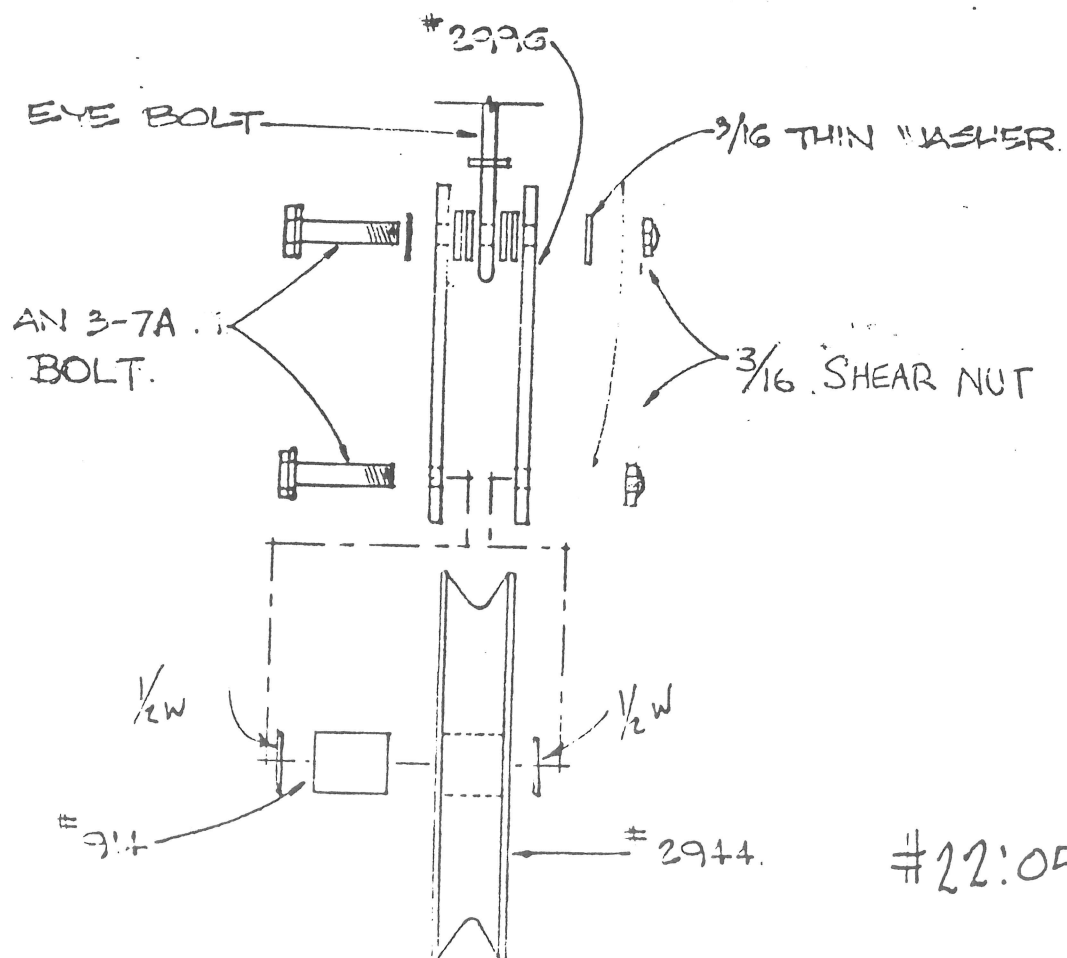
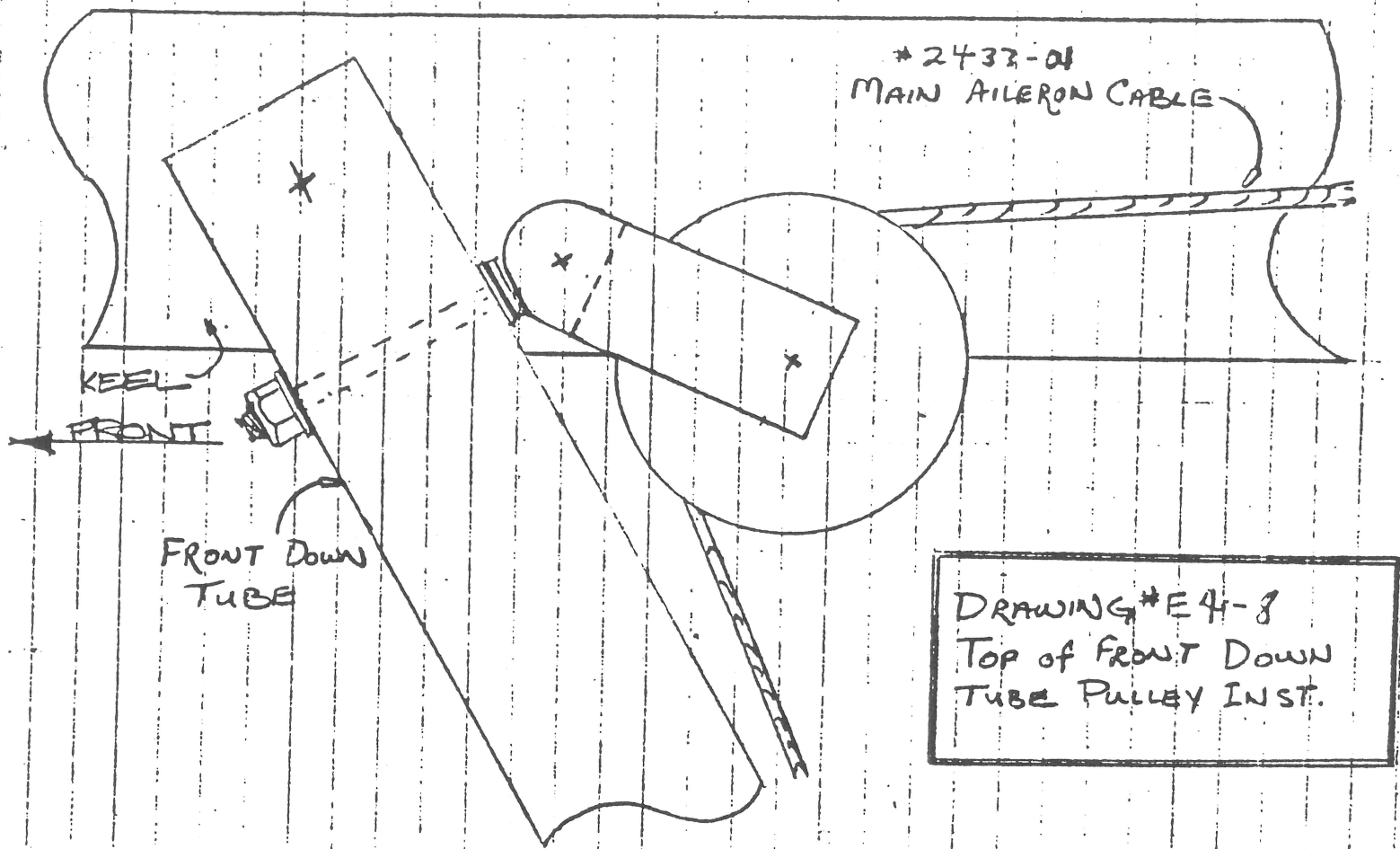
HORN

PUT TANGS ON
EACH SIDE OF
HORN

FRONT VIEW

MAIN CONTROL
TORQUE ARM

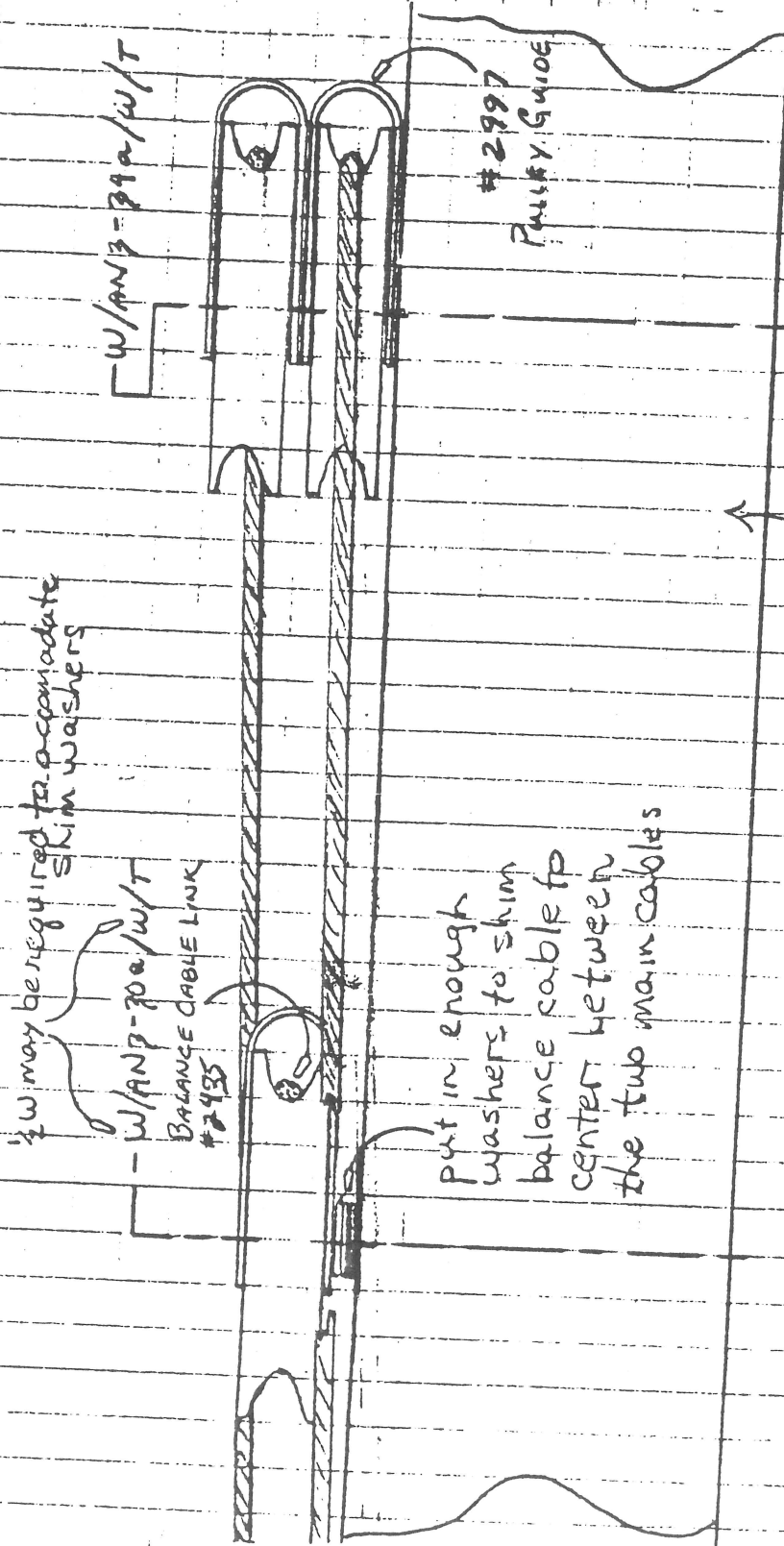
SIDE STRUT X-BAR
& WEB PLATE



SEE WRITTEN
INSTRUCTIONS FOR
CORRECT WASHER
PLACEMENT.

#22:05

#22:06



#2605 KEEL

DRAWING #E4-11
SIDE VIEW OF KEEL
FOR CABLE ROUTING

#22:07

#2434 INTERNAL WING CABLE

AN393-9 CREVIS PIN & COTTER
(SAME LEFT & RIGHT)

#2435 BALANCE CABLE LINK

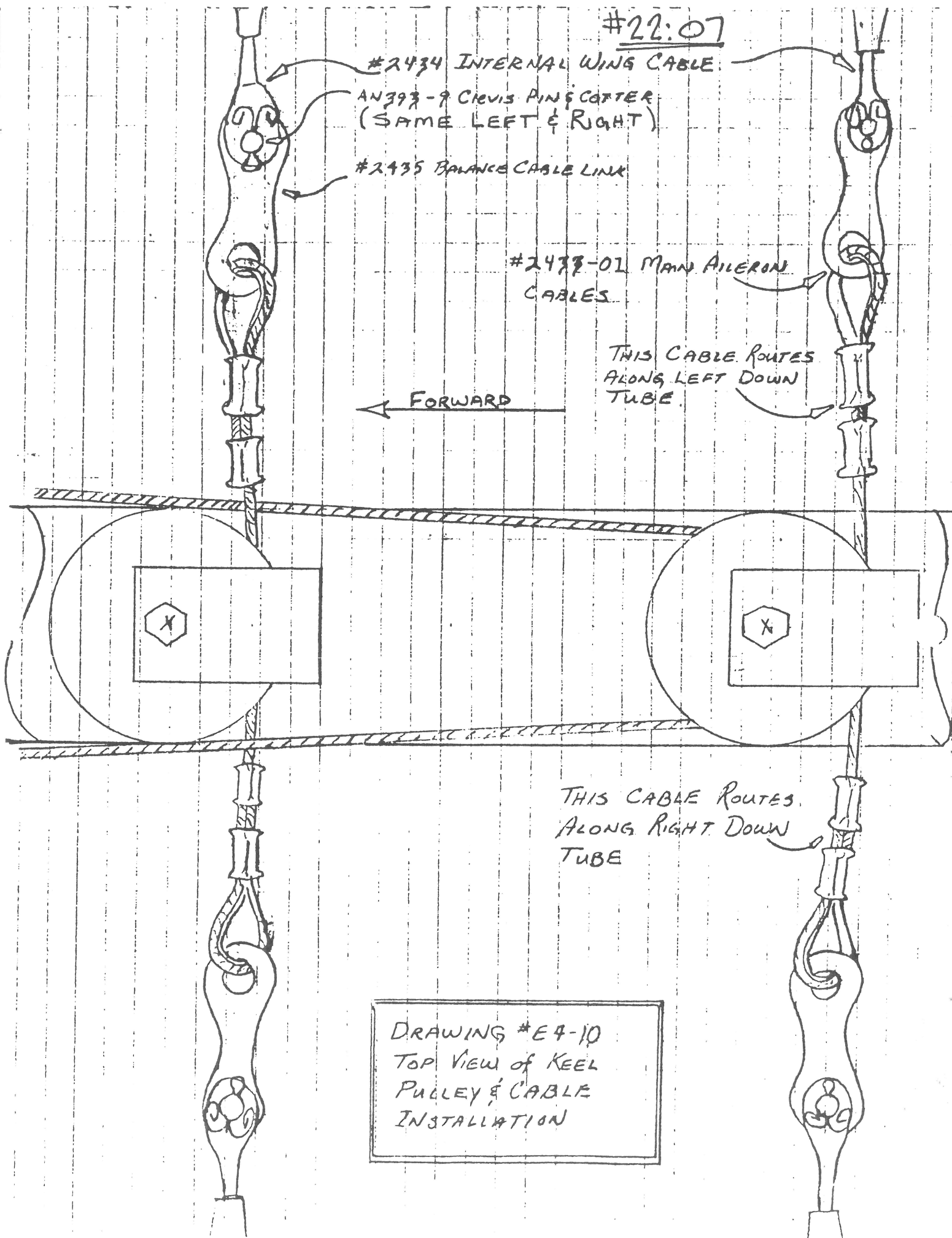
#2438-01 MAIN AILERON
CABLES

THIS CABLE ROUTES
ALONG LEFT DOWN
TUBE

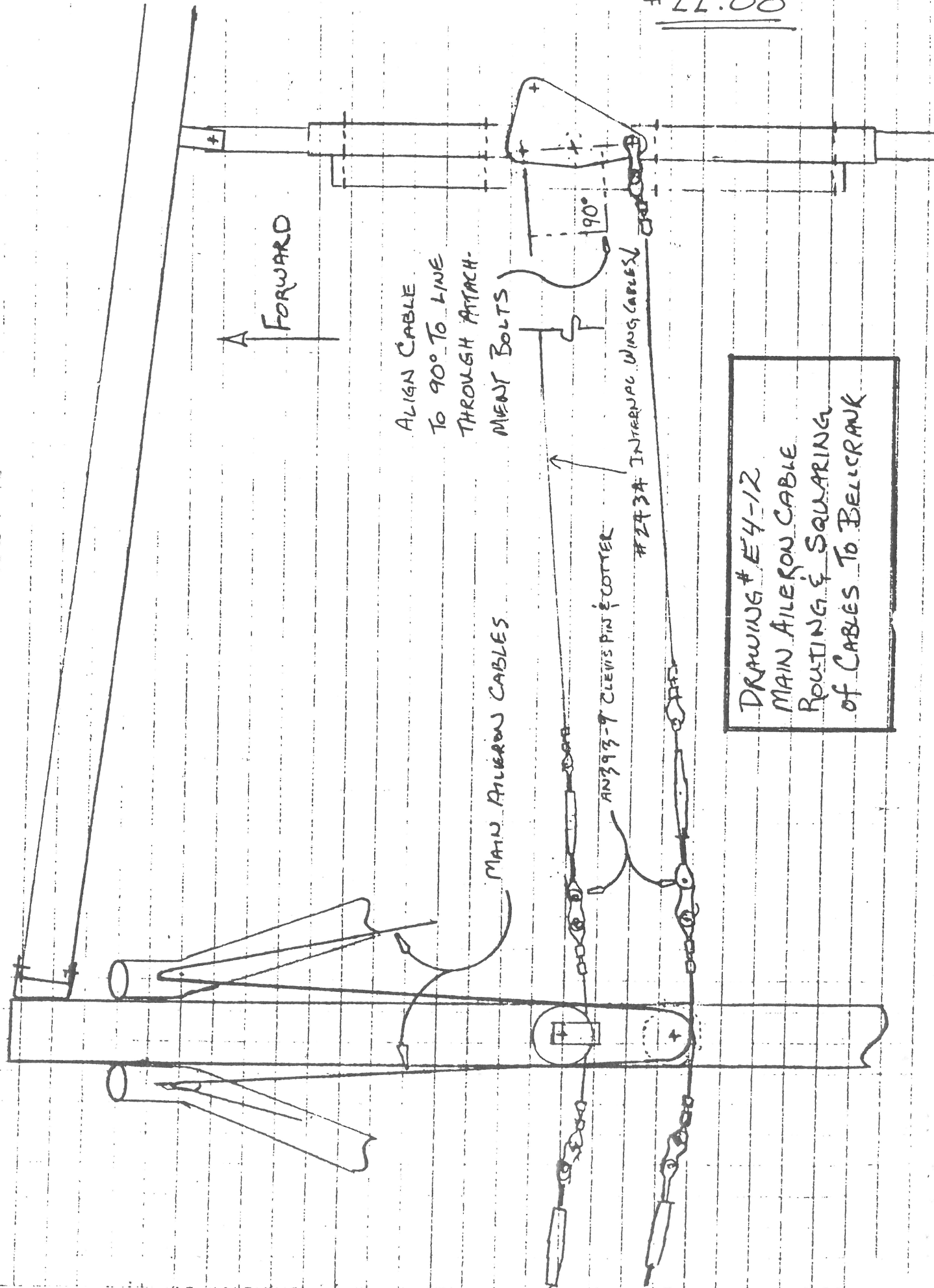
← FORWARD

THIS CABLE ROUTES
ALONG RIGHT DOWN
TUBE

DRAWING #E4-10
TOP VIEW OF KEEL
PULLEY & CABLE
INSTALLATION

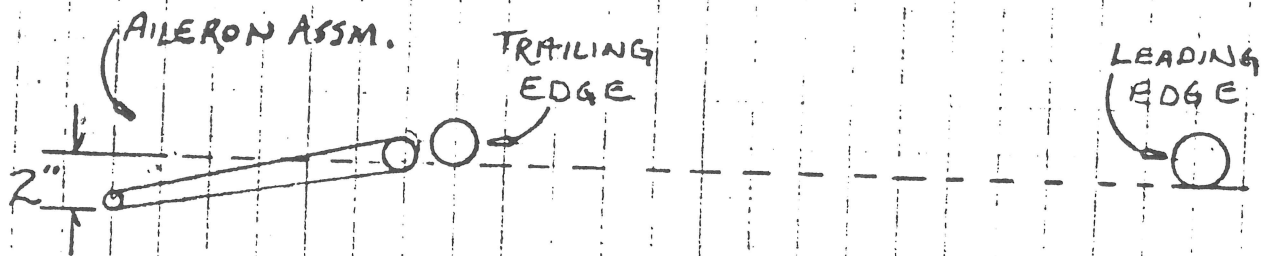


#22:08



DRAWING #E4-12
MAIN AILERON CABLE
ROUTING & SQUARING
OF CABLES TO BELL CRANK

22:09



DRAWING # E4-17
AILERON SETTING

SECT.B STEP No.23: WING COVERING

Parts Requirements

Part No.	Description	Qty. Req'd
2001 L&R	Wing Cov.	1 ea.
2013	Rib #1	2
2014	Rib #2	2
2024	Rib #3	2
015	Rib #4,5,6	2
016	Rib #7	6
017	Tip Rib #8	2
018	Elliptical Tip Tube	2
2021	Trailing Edge Tube	2
Miscellaneous	Qty.	
Duct Tape		
#14 x 5/8" Screw	2	
1/8"cord	5 @ 18"	

SECT.B STEP No.23: WING COVERING

1.) Pre-covering Check;

a) All wing bolts need to be properly tightened down with the exception of Stn.1, and Stn.6 wing bolts. Check that all others are properly fastened.

b) Remove the nuts from bolts at Stn. 6 and pull the bolt back so that only a few threads are exposed through spar, to prevent the sail from catching when installed. A piece of wood inserted between head of bolt and end of compression strut will prevent the bolt from falling out when attaching to grommets on the sail.

c) Check drag wire terminals for proper seating and crosses for safety wiring, as with turnbuckles. Note: Check for any safety wire pointing down which may protrude through the sail.

d) Remove aileron linkages at keel and disconnect push rod from ailerons. Disconnect and remove ailerons from T/E then turn push rod out of rod end on bellcrank.

e) Disconnect all jury struts and remove wing struts at leading and trailing edges, then rest the wing tip onto a saw horse.

f) Apply duct tape over all protruding brackets, wing tip, eye bolts and bolt heads, except bolts at stn.6.

Follow the check list below to help confirm all items complete:

1. Stn.1 bolts loose, stn.6 nuts removed.
2. All other wing spar bolts tight.
3. Compression strut bolts tight.
4. Bellcrank assembly bolts tight.
5. Internal aileron cables tied to stn.1 comp.strut.
6. All drag wire crossings safety wired.
7. Inboard drag wire turnbuckles safety wired.
8. Jury strut plates installed and riveted.
9. Wing tip tension strut stop #979 installed.
10. Tape applied to strut brackets, jury plates, eye bolts and rear spar tip.
11. Check that wood block is in the front spar wing tip.
12. Rear spar tip installed properly.

2.) Sail Preparation;

a) Lay the wing cover flat on a clean surface, bottom surface upward (ribs down).

b) Insert #018 tip rib into the curved tip rib pocket, and start tip rib through the hole in the sail tip.

c) By reaching in the large forward zipper and carefully aligning the pocket, work the rib in a few inches at a time, being careful not to twist the pocket on the sail. Check that the rib is all the way into the rib pocket and repeat on the other wing.

3.) Fabric Installation

- a) Pile the fabric on the floor, under the wing tip, and start sliding the cover onto the wing frame. The fabric must go on squarely or it will bind. It may take 3 people, one on each side and one feeding the sail on from the end. You'll encounter a tight spot where the wing strut bracket wraps around the wing spar. Feed each side evenly over these areas inch by inch.
- b) As you reach the end, be sure the tip rib has gone in front of the wood block on the leading edge, with the rib inserted onto the tip at the trailing edge.
- c) At the L/E stn.6, push the grommet over the tip bolt and attach a 1/4" thick nut. You may have to reach in the zipper and push the bolt out a bit.
- d) At the T/E stn.6, push the grommet over the bolt, then insert and tighten nuts.
- e) At stn.1, remove the nut from the wing bolt at L/E and T/E for sail attachment. Use a string through the pull tab on the sail and lever the sail into position. Once the grommets are close to the holes, pop the bolt through, from the inside out and install a thin washer and a nut.
- f) Push all brackets through their respective sail cuts in the lower surface and remove the protective tape. Push the aileron eye bolts through on the trailing edge.
- g) Reinstall the wing struts with appropriate saddles and spacers, inserting bolts from inboard sides of brackets so that the nut is away from the sail.

4.) Ribs Installation;

- a) The sail ribs are numbered #2013, #2014, #2024, #015, #017 for sail pockets #1-#7 starting from root pocket.
- b) Insert #015 ribs to pockets #4, #5 & #6 by inserting ribs through slits in undersurface and into pockets. NOTE: If a rib doesn't seem to go in all the way, try tapping the sail beside the rib, while pushing.
- c) Insert #2013 rib into inboard pocket #1, #2014 into pocket #2 through slit in sail, and #2024 into pocket #3.
- d) Slide #2021 T/E rib tube into sail behind pockets #1-3 with the riveted stop outboard at rib #2024.
- e) The three ribs are grooved at the ends to allow the T/E tube to seat behind them. Insert the stop into #3 rib and pull the tube down (carefully) until seated behind #1 rib.
- f) Insert a string through the sail at rib #2 and loop around the T/E tube. Use a socket driver or piece of wood to push the #2 rib while pulling the T/E tube into position behind the rib.
- g) Reach in through the sail at the rear zipper location at tip and insert #017 rib into the pocket 3/4 way along the last rib. The rib is positioned over the tip rib and retained by a velcro strap at that location.
- h) Insert #016 rib into the pocket at outboard end of aileron location and insert nib into 5/16" hole in tip rib. Filing one corner of the nib will help position the rib better.

i) Locate 1/8" hole in end of tip rib for grommet attachment, at 1/4"-3/8" from end of tube and in alignment with grommet on sail. Drill at this location which should be at about a 45 degree angle from below.

j) Attach the grommet at this location using a #14x 5/8" screw.

5.) Tip Tensioning;

a) If #019 tension strut has not been assembled at this point, see wing section for assembly instructions.

b) The tension strut is used to tension the wing tip. Be sure the milled (grooved) end of #019 is slightly squeezed to fit the 3/4" tip rib curve, and use duct tape around the end to protect the sail.

c) Remove the nut from the 3/16" lock bolt in strut so that elbow can be bent. Insert #019 into the sail, via the large front zipper and insert round end of tube into rib plate attached to L/E spar. Position so that elbow is cocked towards rear and place milled end of strut onto tip rib just behind the the sewn seam line on the lower surface.

d) IMPORTANT! Make sure the end of #019 at the tip is secure and will NOT pop out. Pull the compression strut toward you, straightening it out and drop the AN3-23A bolt through the holes. Check the tension strut for positioning at each end before nutting it. You may have to move the strut back and forth a few times to find the spot on the tip which best leaves the sail wrinkle free.

6.) Wing Tensioning;

a) Both wings are required to be attached for tensioning. Attach 18" cords through the pull tabs at the root of each wing. Tie a loop in one end of the string, and tie one string to each pull tab sewn to fabric.

b) Run the string through the opposite wing tab then back through the loop pulling the fabric tight. A good method used to keep the strings tight is to secure the overlap with a small vise grip wrench. Clamp the two ends and tie a 1/2 hitch knot (for easy untieing). Repeat at each loop and retie the first couple again for a tight finish. Secure each Knot with another 1/2 hitch.

c) Pull the gap cover over and attach the velcros.

7.) Post Assembly;

a) Check all attachment points for sail at stn.1, stn.6 at L/E & T/E and at all rib ends.

b) Reinstall ailerons to T/E spar with gap cover under the front of the aileron. Double check all hinge points!

c) Slide the aileron push rod through slot in sail and turn onto the rod end at the bellcrank. Note: the backing nut will automatically set the proper position for the push rod.

d) Re-attach the push rod to the aileron horn.

e) If aircraft breakdown is not required again, attach all aileron linkage connections with appropriate fittings and with new cotter pins if used.

f) Install all jury struts.

SECT.B STEP No.24:
MOTOR INSTALLATION & LINKAGES

Parts Requirements

Part No.	Description	Qty. req'd
2801-***	Engine Mount Angles	2
2802	Cross Mounts	2
2807	Rubber Shock Mounts	4
2822	Throttle Cable	1
824	3/8" fuel Line	6 ft.
827	Fuel Filter	1
914	Bushing	2
916	Pulleys	2
2937	Plastic Washer 3/4" I.D.	4
998	Pulley Guide	2
* 2814-02	Rubber Adaptor & Hose Clamps	1
* 2815	Air Filter	1
* N/A	Carburetor	1
* N/A	Starter Rope (packed in tool kit)	1
* N/A	Fuel Pump	1
*** 2801-447	Rotax 447 motor mount	
2801-503	Rotax 503 motor mount	
2801-532	Rotax 532 motor mount	

* Rotax supplied parts

Bolt Requirements Qty.

AN3-6A	2
AN3-10A	2
AN5-30A	2
AN6-22A	4

Nuts	Qty.	Washers	Qty.
3/16"		3/16"	
S	4	1/2 W	4
		W	4
5/16"		5/16"	
T	2	FW	4
3/8"		3/8"	
T	4	W	4
		FW	4

Miscellaneous Qty.

10x 30mm bolt	4
Small hose clamps	7
SS Safety wire	2 ft.
Blue Locktight	

SECT.B STEP #24: MOTOR INSTALLATION

1.) Fuel Pump Installation;

Mount the fuel pump to the rear of the torque plate attached to rear downtubes. (see dwg.24:01) Drill 3/16" holes using the pump as a template and secure with W/AN3-6A/W/S, with outlet at top and intake at bottom.

2.) Motor Mount Angle Installation;

a) Position #2801 motor mount angles to each side of the keel, locating rear hole on mount, to aft hole through keel. (see dwg.24:02) Install, using FW/AN5-30A/FW/T inserted through rear hole, then snug the bolt checking that each angle is flush and square with keel tube.

b) Use a center punch to locate hole center at front hole location of motor mount, onto keel. Use a small (3/16") drill to drill a pilot hole, then drill to 5/16" through each angle and keel. NOTE: drill independently each side of keel.

c) Secure front of angle using FW/AN5-30A/FW/T.

d) Inspect the large holes in the motor mount angles, checking that the edges are well rounded to prevent damage to the rubber shock mounts. Install #2807 rubber mounts (male end) through the large holes in each angle from top. Moistening the rubber will help them slide easier.

3.) Engine Installation;

a) Remove the four metric studs from the engine, by locking two nuts together onto the stud and backing it out, or by gripping the stud with vice grips or clamps.

b) Attach #2802 cross mounts to the engine, at the four stud locations using a lockwasher and 10x30mm bolt for each. Use 'blue' loctight or other medium strength bolt adhesive to prevent nuts from vibrating loose, then torque nuts to 320-354 in.lbs. (DO NOT use RED Locktight).

c) Place #2937 plastic washers under the motor angle mounts and over the rubber mount with the de-burred side up.

d) Attach the female end of #2807 rubber mounts under the plastic washer and onto the top rubber mount.

e) Place FW/AN6-22A/W/T through each of the four rubber mounts, inserted from the top. Leave nuts off for motor mounting.

f) Check that metric nuts on studs are properly torqued then lift the engine into position under the four bolts and attach the X-mounts with washers and nuts.

g) Secure and tighten the 5/16" bolts until all the slack is removed, then tighten each nut about 1 full revolution, to lightly preload the rubbers. NOTE: There should be at least 2 threads showing on the bolts after proper tightening. A heavy push about 50 lbs., on the side of the engine will help seat the rubbers.

4.) Engine Pull Start Assembly;

a) The starter rope exiting from the engine must be pointing up towards the pulley webbing mounted to the starboard rear downtube. Remove the ignition damping box from the front of the housing.

b) Remove the forward cap screws on the fan housing, and while holding the cover against the engine rotate the cover in either direction to align the handle with the webbing.

c) Reinstall the housing screws and relocate the ignition damping box into holes provided.

d) Clamp a set of vise-grips onto the starter rope to PREVENT the rope from REWINDING into the engine, or tie a knot in the rope to do the same while removing the handle.

e) Tie the starter rope provided in the engine tool kit to the engine rope using a bowline knot to provide adequate length to front pilot.

f) Assemble #916 pulleys (2 req'd) with #914 brass bushings and #998 pulley guide, and attach with starter rope (knot to front) inside pulley to rear pulley webbing using 1/2W/AN3#10A/1/2W/S inserted through grommets and assembly.

g) Run the rope to the webbing under the forward foot support tube and attach the other pulley in the same manner.

h) Retie the starter handle at the front location with a minimal amount of tension on the starter, then cut away any excess rope.

5.) Carburetor Mounting;

a) Mount the carburetor to the engine with the #2814#02 rubber adapter and the 2 hose clamps provided. Snug up the clamps to a firm tightness, which should be checked again before the initial engine start up, and after the break in period. The carburetor must be set perpendicular to the engine at all times and must not be permitted to rotate under vibration.

b) Connect the gas lines and vacuum line using #824, 3/8" gas line provided. At all connection points on the fuel system, use the small hose clamps provided to secure fittings. (7 req'd)

c) Attach #827 gas line filter to the fuel line extending from the seat tank and secure with small hose clamp. Approx. 15"-16" is required for the intake line from the seat tank. Secure one end to the filter and the other end to the fuel pump intake. Check arrows on pump for flow direction.

d) Approx. 20" of line is required for the carburetor intake. Secure the line at the outlet on the fuel pump and at the carburetor intake.

e) The vacuum line attaches to the center fitting on the fuel pump and at the fitting off the crankcase housing on the engine. NOTE: use a minimum length of tubing required without causing any kinks in the line. (approx.17")

6.) Throttle Cable Installation;

a) Remove the top of the carburetor for installing the cable. Note: although the top of the carb looks symmetrical, it will only fit properly one way, so keep this in mind when reinstalling.

b) See page 7 of the Rotax Engine Manual for a detailed look at the carburetor. It is basically comprised of 5 parts: needle; adjustor ring; plastic center guide; return springs; and the slide piston.

c) Insert the fitting end of the cable through the rubber boot, adjustment screw and the carb.top, through the return spring, plastic cup, adjustment ring, and through the hole in the piston. The fitting is then slid into the retaining slot and seated in the bottom of the piston.

NOTE: The ring must be located below the plastic guide when assembled. The ring holds the needle at 3 different levels for mixture adjustment. Lowering the needle by putting the ring in the top slot, restricts fuel flow, and leans fuel to air mixture. Raising the needle by inserting the ring in the lower slot, allows more fuel to flow and richens the fuel to air mixture. The middle setting is recommended for engine break-in.

d) Reinstall the slider piston into the carb, aligning the key way in piston with key in carburetor. Watch through the air intake opening as the needle lowers into the bottom area of the carb allowing it to drop through. Set the top of the carb in place checking that the top is not missaligning the cable entrance due to it being off-center.

7.) Post Assembly Procedures;

a) Check proper slide movement in carburetor by pulling on the throttle cable several times. Check all fittings on carb and attachment to engine.

b) Check all hose fittings from engine to tank.

c) Check directional arrows on both gas filter and pump for proper fuel flow.

d) Check all motor installation bolts for tightness.

e) Inspect starter rope system.

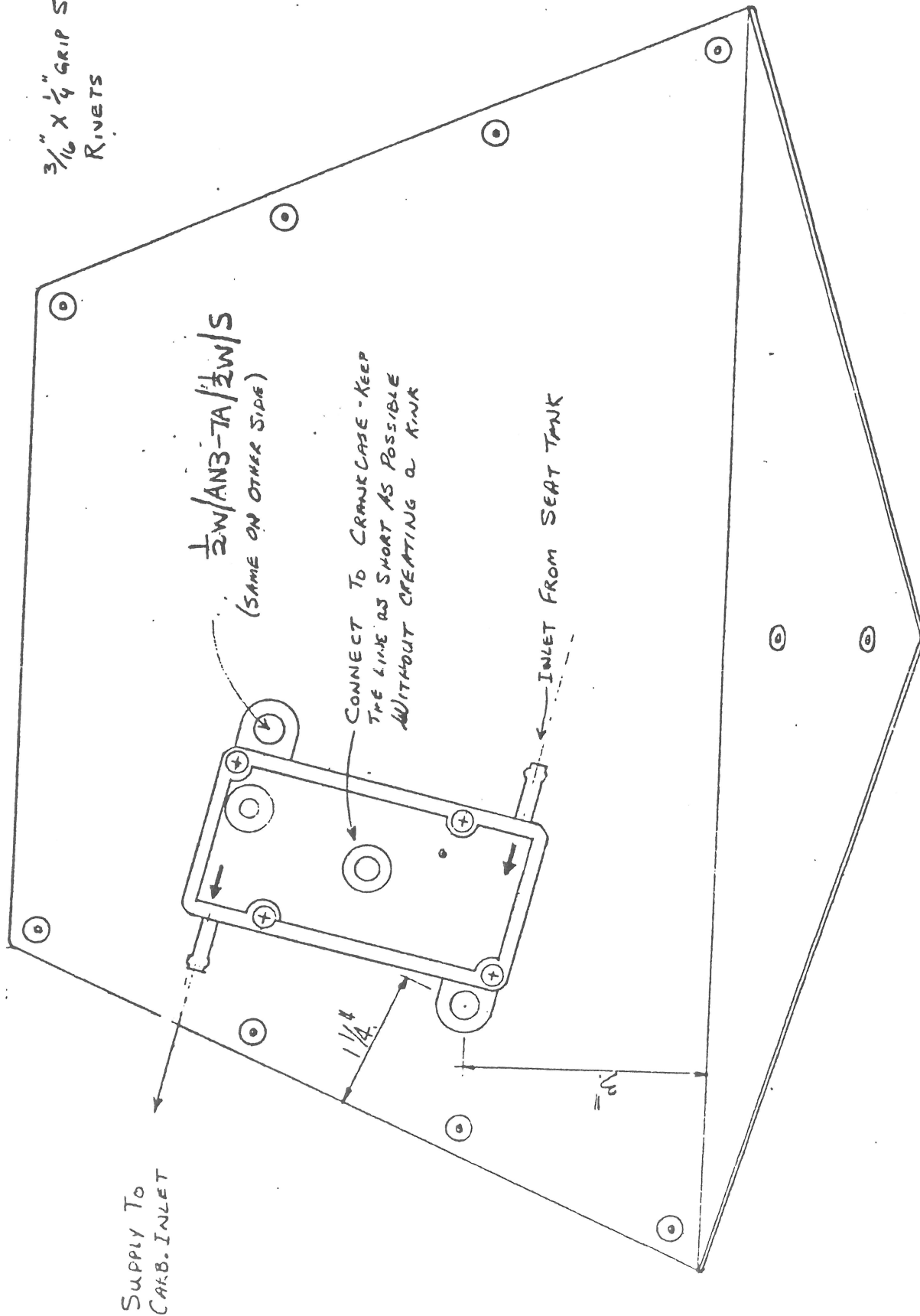
8.) Install #2815 air filter to air intake on carburetor. It is highly recommended to drill two or three small holes in the outer edge of the air filter and safety wire the air filter to the engine.

24:01

TOGGLE PLATE INSTALLATION
WITH FUEL PUMP POSITIONING

$\frac{3}{16}$ " X $\frac{1}{4}$ " GRIP S.S.
RIVETS

REAR VIEW

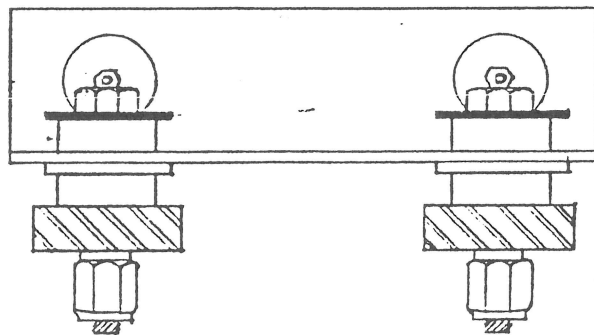
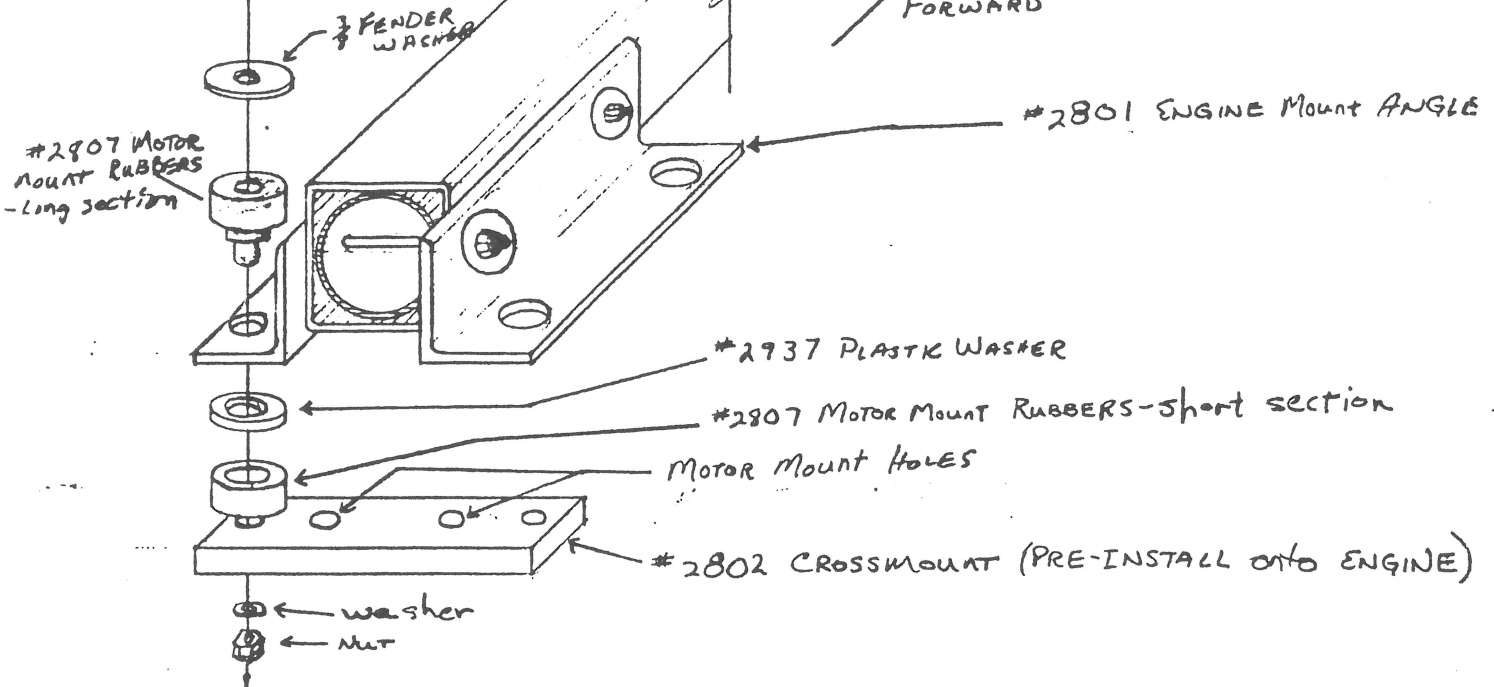


#24:02

ANG-22A/FIN/U/T

(TYPICAL)
4 positions

FORWARD



SIDE VIEW

MOTOR MOUNT
INSTALLATIONS.

BING JET CHART (NEW)

APR 0 8 REC'D

	277(1)	277(2)	377(1)	377(2)	447(1)	447(2)	503(1)	503(2)	503DUAL	532(1)
MAIN JET	148	140	165	155	165	155	180	158	158	165
IDLER JET	45	45	45	45	45	45	45	45	45	55
NEEDLE JET	2.72	2.72	2.70	2.70	2.70	2.70	2.74	2.74	2.74	2.72
JET NEEDLE	812	812	802	802	15K2	15K2	802	6H2	812	802
POSITION	2	2	2	2	2	2	3	3	1	3
IDLER SCREW (TURNS OUT)	1	1	.5	.5	.5	.5	.5	.5	.5	1

ALL ABOVE WITH WINDOW IN BOTTOM OF PISTON 2303B
ENGINE SIDE, 4.4mm WIDE X 3.8mm HIGH.

- (1) WITH FOAM AIR CLEANER (MUSHROOM TYPE OR K&N RC-2440), WITHOUT ROTAX
AIR INTAKE SILENCER OR ROTAX AFTER MUFFLER KIT.
- (2) WITH ROTAX AIR INTAKE SILENCER, WITH K&N CH-30 AIR CLEANER, WITH OR
WITHOUT ROTAX AFTER MUFFLER KIT.

RX550-ASSEMBLY: STEP No.25

BEAVER RX550 AIRCRAFT ASSEMBLY
SECT.B STEP #25: THROTTLE LEVER INSTALLATION

Parts Requirements

Part No.	Description	Qty. Req'd
502	1" End Caps	2
524	1" saddles	2
826	Throttle Cable Clamp	1
2839	Stick Stop	1
2834	Front Throttle Lever	1
2835	Rear Throttle Lever	1
2836	Throttle Link Tube	1
913	Plastic Washer	1
964	Throttle Lever Stop	1
983	Bracket	1
2946	1-1/2" Stand-off	1

Bolt Requirements Qty.

AN3-5A	2
AN3-14A	1
AN3-17A	1
AN4-15A	1
AN4-21A	1
AN4-26A	1

Nuts Qty.

3/16"	
S "	3
T "	1
1/4"	
S "	1
T "	2

Washers

3/16"	Qty.
1/2 W "	7
W "	5
1/4"	
1/2 W "	6
W "	2

Miscellaneous

Qty.

3/16"x 1/4" grip SS rivet	4
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SECT.B STEP #25: THROTTLE LEVER INSTALLATIONS

- 1.) Locate and drill 1/4" hole through port side of web plate, for positioning lever brkt. (see dwg.25:01 detail 'A')
- 2.) Attach #983 brkt. to rear side of web plate. The base of the brkt. is mounted flush with the rear side of the top X-bar, by placing #2946, 1 1/2" poly stand off bushing between web plate and brkt. Use W/AN4-21A/W/T inserted through brkt., stand off, and web plate.
- 3.) Position the bracket, with the 3/16" hole over the X-bar, and temporarily pin #2835 throttle lever to the brkt. (see dwg.25:01 detail 'B') Position the top of the throttle lever at 2 1/4" from the inside of the rear downtube and make a reference mark for brkt. location.
- 4.) Tighten the 1/4" bolt through brkt. and web pl., then remove the throttle lever. Check brkt. position with ref.mark then drill and set 3/16"x 1/4" grip SS rivet, through 3/16" hole in brkt. and rear of side strut X-bar.
- 5.) Re-install the rear throttle lever with 1/2W/1/2W/AN4-15A/1/2W/1/2W/S placing 1/2 washers each side of the throttle lever between the brkt., and each end of the bolt.
- 6.) Connect #2834 throttle lever (3/16" hole to bottom) to the 1/4" hole in the 'port' pilot side tube, adjacent to the forward seat. The lever is mounted to the inboard side of the side tube with two #524, 1" saddles between lever and side tube. Use 1/2W/AN4-26A/1/2W/T inserted from outboard side, and tighten until movement is smooth without any side play in stick.
- 7.) Thottle Cable Installation;
 - a) Route the throttle cable down from the engine, avoiding any sharp corners which could kink the housing, along the rear port downtube, then over the X-bar, inboard of the front downtube.
 - b) Create a large loop and double the cable back under the web plate.
 - c) Attach the bushing at the end of the cable to the inboard side of the throttle lever, using W/W/AN3-17A/W/W/T, finger tight, with a washer each side of the cable bushing. (see dwg.25:02)

8.) Positioning Cable Clamp & Throttle Lever Stop;

a) The #2839 throttle stop plate, and #826 cable clamp, are attached together under the web plate, by bolting onto the 1/2" lip on web pl.

b) Place the cable clamp onto the throttle stop pl. flush to one side, then trace drill 3/16" through holes in clamp.

c) Position the stop and clamp assembly under the web plate with the throttle cable placed between the two. The forward side of the stop pl. is mounted flush with the front of the web pl., and the cable clamp is positioned at the center of the lip on the web pl. (see dwg.25:02)

d) Properly align the cable clamp position, on the lip of the web pl., with the attachment point of the cable onto the throttle lever, then clamp them into position.

e) Check that cable is attached to inboard side of throttle lever and that throttle movement maintains alignment with cable position. Drill 3/16" through cable clamp, stop, and lip of web plate, then insert 1/2W/AN3-5A/1/2W/S, finger tight. (two req'd)

f) With the throttle lever in full back position against the stop, adjust the cable housing, for and aft, so that the housing is close to the bushing attachment, to prevent the cable from buckling, however with enough room for proper movement of the cable as the lever is used. Tighten the bolts clamping the cable housing in position.

9.) Max Throttle Stop;

a) Assemble the throttle stop by attaching #913 plastic washer to the short end of #964 plate, using a 1/2 washer and 3/16"x 1/4" grip SS rivet.

b) Position the cable adjusting screw at the top of the carburator to about the mid-position of adjustment.

c) Push the throttle lever ahead to max throttle, (listen for the piston hitting the top limit in the carb.) then back it off about 1/4".

d) With the throttle lever in position, place the throttle stop onto the side strut x-bar, with the plastic washer against the lever. Drill #11 through the 1/4" hole in the stop, through the X-bar and set a 3/16"x 1/4" grip SS rivet. Drill a second hole through the stop and X-bar for another rivet.

10.) Connect the throttle levers together by attaching #2836 throttle link tube, to the 3/16" holes on the lower end of each.

a) At the rear lever attach the link tube to the outboard side, onto the bolt inserted for the cable, with a washer at each side of the tube.

b) At the forward throttle lever attach the link tube to the lower outboard side, using 1/2W/W/AN3-14A/1/2W/S with a washer between the link tube and the front lever.

11.) Attach the foam rubber tubing which was cut from the pieces for the control sticks, to each of the throttle levers.

12.) Insert #502, 1" end caps to the tops of the levers.

13.) Post Assembly;

a) Check throttle levers for smooth operation. Note: the levers should be tightened onto their swivel points so that when a throttle setting is desired, the tension easily holds the spring return in the carb.

b) Check cable alignment, watching for signs of cable buckling at each end of housing, and cable attachment at rear lever for ability to swivel freely.

c) Check all bolts and rivets for proper installation.

NOTE: It is recommended to apply a little WD40 or typical type of oil into the throttle cable line as a standard procedure, every 15 hrs. of operation or once every two months, to prevent siezure caused by corrosion or dirt. This is IMPORTANT when operating in cold weather conditions, as water can seep into the outer casing and freeze causing malfunction, which could occur once airborne, or once freezing level altitude is reached.

RX550-ASSEMBLY: STEP No.26

BEAVER RX550 AIRCRAFT ASSEMBLY
SECT.B STEP #26: PROPELLER MOUNTING

Parts Requirements

Qty. Req'd

Propeller	Rotax 447 : 64x 30	1
	Rotax 503 : 64x 32	

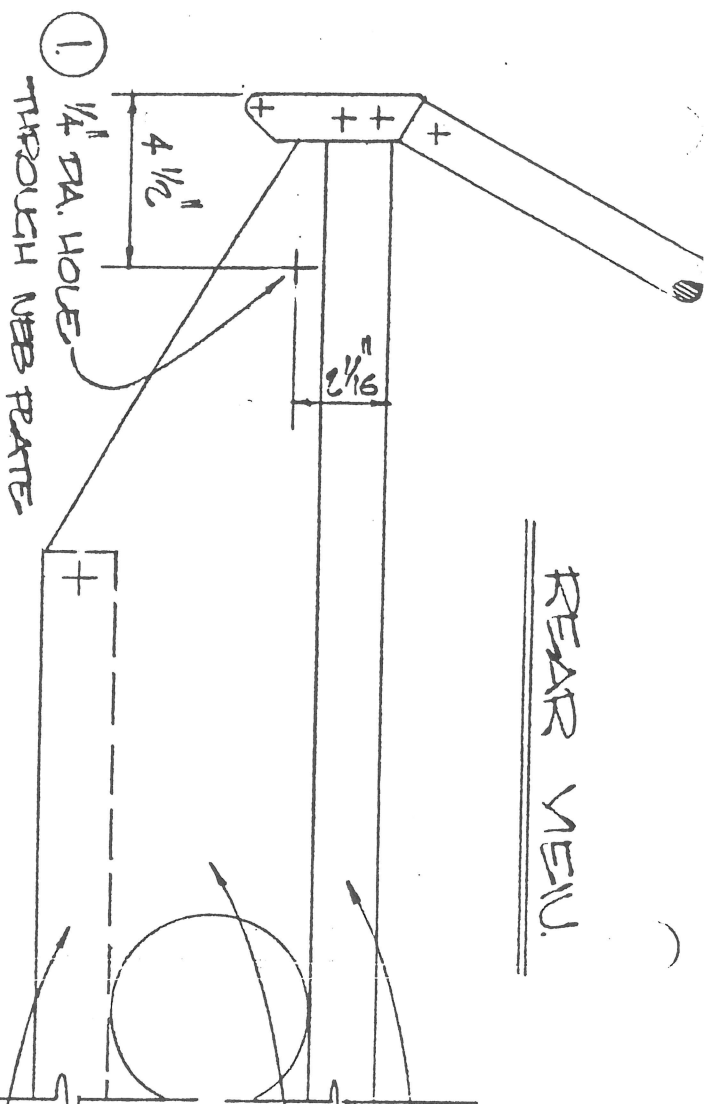
Metal Hub Plate

1

Miscellaneous	Qty.
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8x 85mm bolts	6
8mm locknut	6
5/16" 1/2W	12

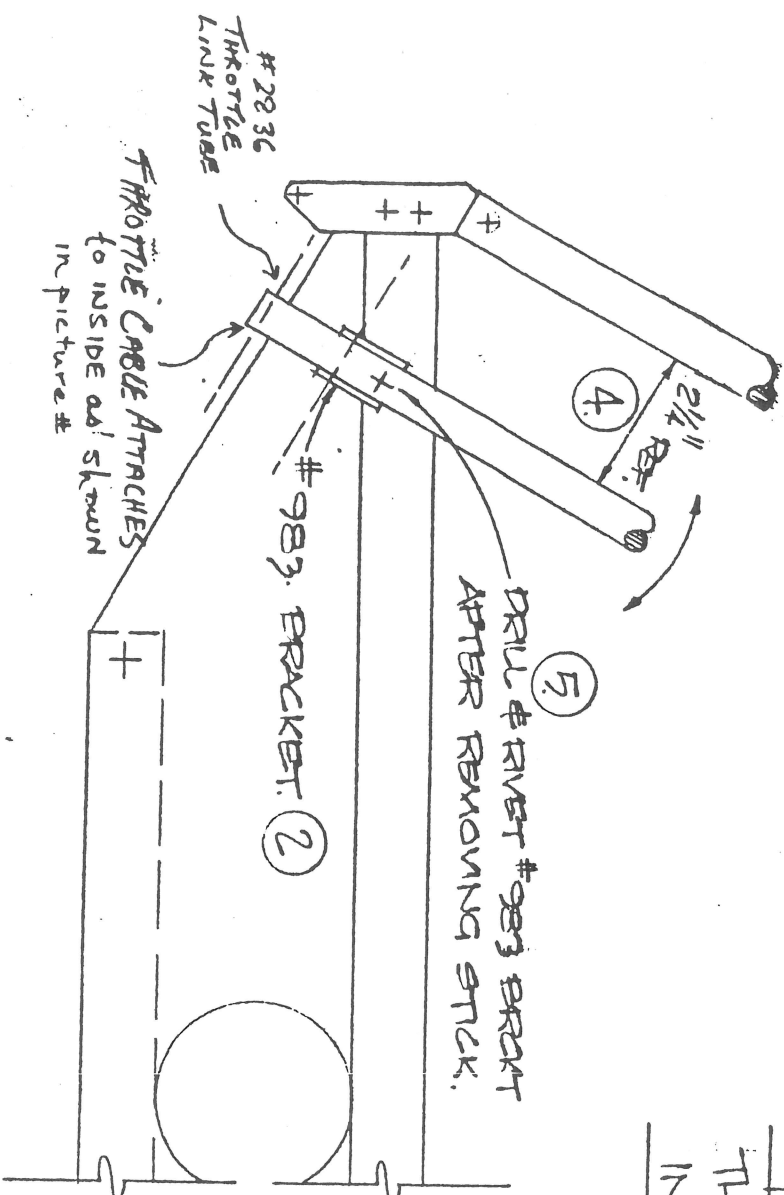
REAR VIEW.



SIDE STRUT X-BAR.
#2601 WEB PLATE.
LANDING GEAR X-BAR.

THROTTLE LEVER SUMMARY INSTALLATION SEQUENCE.

- ①-DRILL HOLE THROUGH WEB PLATE
- ②-INSTALL #983 BRACKET
- ③-INSTALL #2835 REAR THROTTLE LEVER.
- ④-POSITION TO 2 1/4" REFERENCE MEASURE FROM DRAWING.
- ⑤-REMOVE REAR STICK, DRILL AND SET 3/16 X 1/4" GRIP RIVET THROUGH #983 BRACKET.



DRILL & RIVET #983 BRACKET
AFTER REMOVING STICK.

#983 BRACKET. ②

#2836
THROTTLE
LINK TUBE

THROTTLE CABLE ATTACHES
to inside as shown
in picture #

REAR THROTTLE LEVER. #25:02 BOTTOM VIEW.

#2835
REAR THROTTLE
LEVER

* $\frac{1}{2}$ washers each side

$\frac{1}{2}$ W/ $\frac{1}{2}$ W/AN4-15a/ $\frac{1}{2}$ W/ $\frac{1}{2}$ W/S

FUSELAGE
CENTER

FORWARD

DETAIL 'A'
(Through Bottom of Stick)

#2826-01 STICK STOP.

#826 THROTTLE
CABLE CLAMP.

$\frac{1}{2}$ N/AN3-5A/ $\frac{1}{2}$ N/S.

WEB PLATE

THROTTLE CASING.

#2946
NYLON SPACER

EXPLODED VIEW. Bottom View

$\frac{3}{16}$ THICK NUT

WING TIP

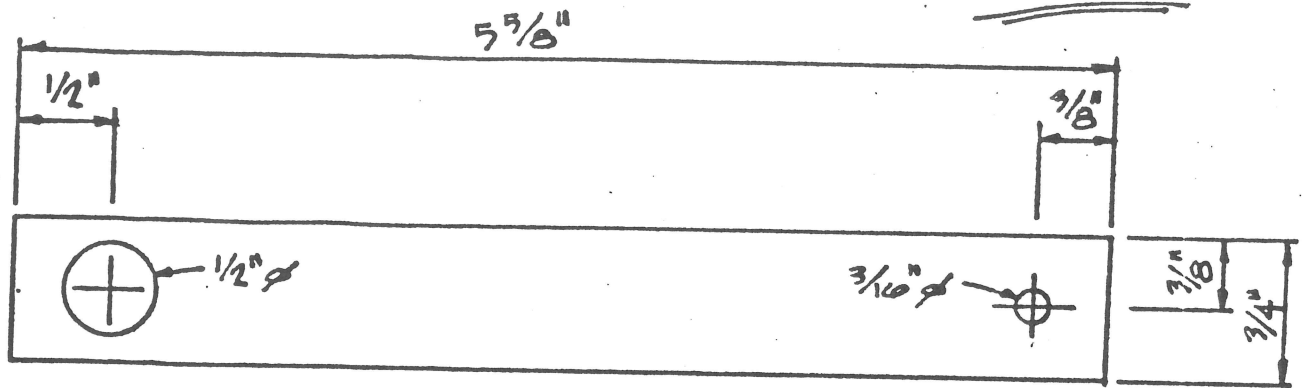
$\frac{3}{16}$ Thick
Washers

AN3-17a

#2826.

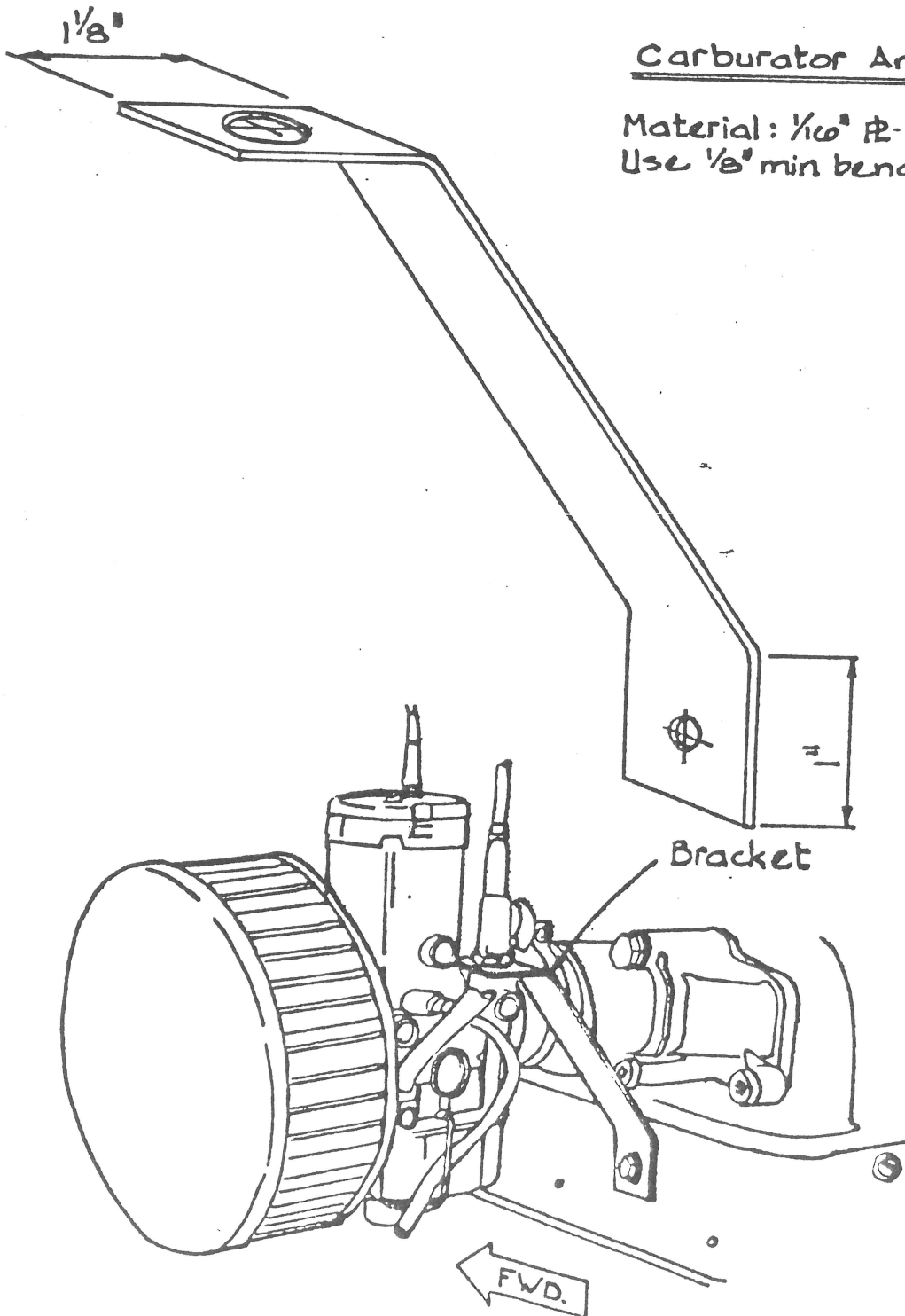
DETAIL 'A'

#25!03



Carburator Anti-Twist Brkt.

Material: $\frac{1}{16}"$ AL-6061-T6
Use $\frac{1}{8}"$ min bending radii for bends



BEAVER RX-550 AIRCRAFT ASSEMBLY
SECT.B STEP #26: PROPELLER MOUNTING

Parts Requirements

Qty. Req'd

Propeller	Rotax 447 : 64x 30	1
	Rotax 503 : 64x 32	

Metal Hub Plate

1

Miscellaneous Qty.

8x 85mm bolts 6

8mm locknut 6

5/16" 1/2W 12

SECT.B STEP #26: PROPELLER MOUNTING

1.) Mounting The Propeller;

a) Prior to installing the prop, check all of the thread ways in the hub for metal cuttings and clearness.

NOTES: The propeller type used for the Rotax 447 engine outfitted with a factory gear drive system is a 64x30. The first numeral (64) designates the overall diameter in inches, while the second numeral (30) designates the pitch.

The Rotax 503 with factory gear drive uses a 64x32 propeller.

The direction of rotation for 'factory' gear drives is a clockwise direction when viewed from behind. Belt driven systems will be opposite to the gear drives.

Every propeller has a leading and trailing edge for which will determine the proper mounting direction. The leading edge of the prop will be curved much the same as the leading edge of an airfoil, with the curved side to the lifting or forward side of the prop.

In most cases the propeller will be balanced and ready for installation onto the engine, however, it does not take much time to check the balance prior to installation. If on the other hand, once mounted and you find excessive vibration when running the engine, prop balance could be a primary source.

BEFORE mounting a new propeller CHECK and INSPECT for flaws in the wood or possible damage caused in shipment. It is possible that any defects could show visible signs when subjected to varying temperatures and humidities.

NOTE: Any questionable propellers must be returned to your dealer or factory without signs of mounting onto engine for warranty.

b) Position the prop onto the reduction drive hub, with the curved surface forward. Mount the propeller with the metal prop plate against the rear face, using 8x85mm bolts (6 req'd) with a 5/16" 1/2 washer against the bolt head, through the plate, propeller, and into the tapped hub. Start bolts into the hub only.

c) Install all the bolts without turning each one more than 4 or 5 turns into the hub at any one time. Alternate from one bolt to another until all bolts are lightly snug. Final torqueing of the bolts is completed when trueing the prop.

2.) Checking Propeller Track;

The track of the propeller is an imaginary line created by the tips as they rotate around the hub. With the prop in a vertical position, measure square from the motor post to the tip of the prop at the leading edge keeping the ruler parallel to the fuse tube. Rotate the prop 180 degrees and measure the tip at the leading edge from the same point as the first measurement.

3.) Trueing the Track;

The tolerance of the prop track must be within 1/8" of each side. To correct the propeller for track, the hub bolts are tightened at the side which requires pulling in, and initially less at the opposite side. Note: Each bolt must be tightened to 30 in.lbs. Check the track as bolts are tightened to required torque.

4.) Hub Bolt Locking;

Rather than lock wiring each bolt, install 8mm locknuts with thin 5/16" washers to the front of the hub lightly snugging each nut up with about 24 in. lbs. of torque.

5.) After engine break in recheck the track of the prop since the wood has had a chance to compress, and recheck the torque of the prop bolts.

RX-532 SP MUFFLER MOUNT

STEP27A.

RX-532 SP MUFFLER MOUNT.

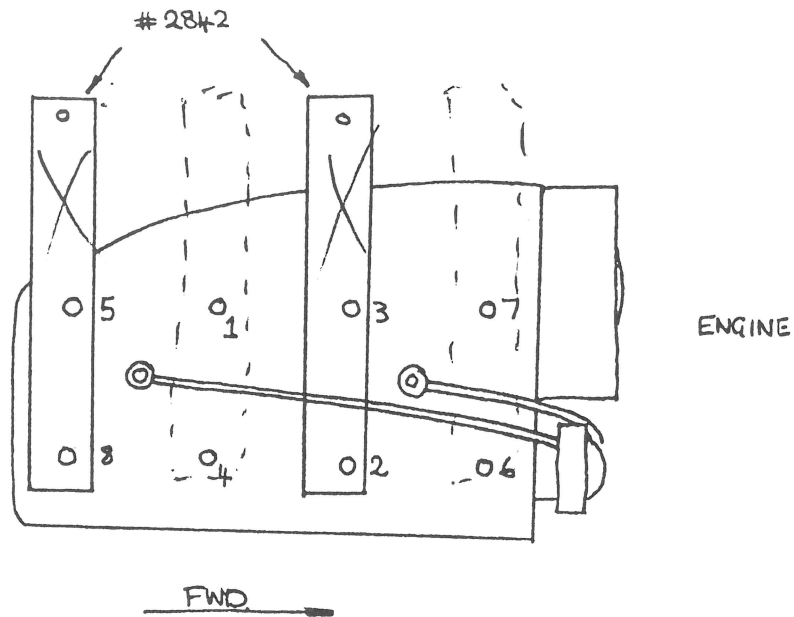
Parts Requirements.

Part No.	Description.	Qty.
B10	Muffler Load Mount	2
2840A	Muffler Wraparound	2
2854	Muffler Angle Mount Bracket	2

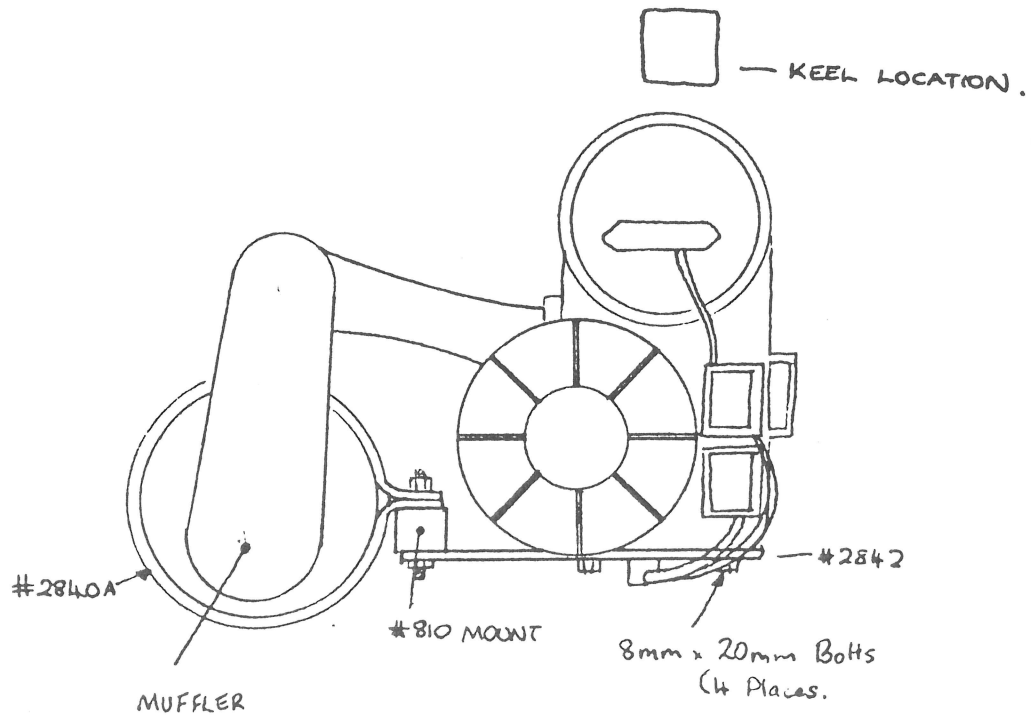
Misc.

Description.	Qty.
8mm x 20mm Bolt	2
8mm Lockwasher	2
5/16" Light Washers	8
5/16" NC Nylock Nuts	4
High Temperature Lubricant	- Customer Sourced

DRAWING 27:1
MUFFLER MOUNT.



VIEW FROM BENEATH
HEAD NUT TIGHTENING SEQUENCE



VIEW FROM FRONT.

MUFFLER MOUNTING.

1. Engine must be cold.
2. Remove engine cooling shroud by removing the 3 bolts through the shroud into the cylinder head standoff nuts and loosening the screws holding the halves of the shroud together.
3. Check the dimension of the cylinder head standoff nut supplied with your aircraft. The following dimensions are given for your reference:

ENGINE	NUT PART NO	DIMENSION (mm)
447	842-010	8mm x 27.5mm
503	842-050	8mm x 37mm

4. Cylinder Head Standoff (or "distance") nuts are currently installed at positions 1, 2 and 8 (See diagram). For the purposes of mounting the muffler brackets the standoff nuts need to be at positions ~~2, 3, 5 and 8~~ ^{1, 4, 6 and 7}. To preserve the integrity of the cylinder head attachment only loosen 1 nut at a time and retorque it to 210 in/lbs. before loosening another nut.

5. Remove standard head nut from position #3. Install the supplied new standoff nut at position #3 and torque to 210 in/lbs.

6. Remove standoff nut from position #1. Install the standard nut left over from the previous step and torque to 210 in/lbs.

7. Remove standard nut from position #5 and replace it with standoff nut left over from the last step and torque to 210 in/lbs.

8. Check torque on all cylinder head nuts to 210 in/lbs in the sequence given in the Diagram. Torque in sequence pattern from 1 to 8.

9. Measure and drill 3/8" new holes in the cooling shroud to line up with the new position of the standoff nuts at positions #3 and #5.

10. Re-install the cooling shroud. Attach the #2842A muffler mounts to the outside of the shroud using 8mm x 20mm bolts supplied, with lock washers under the bolt heads, into the standoff nuts at position ~~#1, #3, #5 and #7~~ ^{#1, #4, #6 and #7}. NOTE: The attachment holes in the muffler mounts are offset to allow clearance around the spark plug. Torque to 175 in/lbs. DO NOT USE LOCKTITE. Tighten screws on the shroud sides.

11. Install muffler and muffler springs. Lubricate the ball joint of the muffler with high temperature grease. (Available from Brake & Muffler shops) Position 2840-01 wraparounds and attach to the #2842 mounts with FW/AN4-10A/FW/High Temp Nut. Sandwich a #523 rubber mount between the wraparound and the muffler mount (see diagram).

NOTES:

1. Muffler springs should be safetied. Use 2 pieces of stainless steel safety wire per spring. Loop the wire through the spring coil and the attachment loops. One piece of wire for each loop.
2. Regrease ball joint with high temp grease every 50 operating hours or every 3 months whichever occurs first.
3. If the factory installed standoff nuts are not in the positions indicated in this chapter, follow the general instructions given here. Remember: DO NOT have any more than 1 nut loose at any one time.

It is required to have the standoff nut at positions #1, #2, #3 and #4.

Make sure you have the correct standoff nut for your engine.

Step 28 Electrical Installation

Parts Required

2828 Single Pole Single Throw Switch	1
2829 Ignition Switch Wire	76 in.
832 Cable Tie	5
N/A Rotax Supplied Cable End Fittings	

1. At this time a brief discription of standard practices involved in electrical installations is probably in order. The electrical installations used on the Beaver RX550 are extremely simply. However, time spent on careful preparation and installation now will save any amount of trouble later on with a "failed" or "dead" engine.
2. The elctrical connectors used are supplied by Rotax and are simple male to female slide connectors common throughout the automotive field. An inspection of the parts (packed inside the engine box) will reveal the differences between the types and hopefully their application will become clear.
3. To install a connector the following steps need to be followed.
 - (a) If double conductor wire is used, separate the two conductor lines beginning with a sharp knife cut and pulling apart with the fingers. The insulation will split down a natural join-line between the conductor cores. Normally a separation of 1 1/2" to 2" is sufficient.
 - (b) Using electricians wire strippers, or with practice a sharp knife, strip off approximately 1/2" of the insulation exposing the bare conductor wires beneath.
 - (c) Slide the clear plastic weather protector tubes on the wires passed the exposed wire.
 - (d) Slide the wire inside the connector. With the connect swaging tool (available at any automotive supply store) crimp the connector around the cable in such a way as to ensure maximum contact surface without interfering with the sliding contact face of the connector.
 - (e) With care, ensure proper electrical contact by soldering the cable into the connector. Try and prevent any solder from getting into the connector sliding face as this will prevent proper electrical continuity later on. Use resin core solder, a small iron and good quality electrical flux. Soldering is not difficult but if you are not too confident practice a little before you try the connectors on the aircraft. Please do not overlook this step. The increased reliability of the finished circuit more than makes up for a little extra care now.

- (f) Clean any excess soldering flux off the finished joint and slide the previously installed weather protector shield up and over the joint. A quick inspection of the finished wire connectors on the engine will give you an idea of what your installation should look like.
4. Prepare the # 2829 ignition wire as detailed in step (3) above with 2 male connectors on the other end (for engine wiring connection).
5. Install the cable to the switch #2828 with the end holding the 2 female connectors. Remove the locking screws in the connector tangs on the switch. Slide the cable connectors on to the switch tangs. By carefully drilling through the connectors fitted to the cable you can re-install the locking screws. This is advisable but not absolutely necessary. Slide the plastic weather protector up so it fully covers the connectors.
6. Install the #2828 switch into the previously installed #2980 ignition switch plate on the Left Hand pilot side tubes. This is accomplished by backing of the slim locknut on the switch. Sliding the switch up through the plate and refitting the locknut.
7. Connect the other end of the wire to the 2 BLACK wires on the engine. The magneto's on the engine are operating when they are isolated. By closing the switch you are in effect earthing the magneto's to each other and consequently shutting the engine down.
8. Secure the cable to the left rear downtube and the LH pilot support tube with the #832 cable ties, trimming off the excess.
9. Should you wish to use a tachometer with your aircraft the "Moto-Ski" tachometer supplied by Spectrum Aircraft is connected up in the following manner:
 - (a) Pre-fabricate another cable as detailed in Step 3 above. Taking note of the connector pieces required for proper set-up.
 - (b) Connect the 2 Green/Yellow wires at the engine with the 2 Yellow/Red Stripe wires on the tachometer. Polarity is not important, because of the alternating current used the tachometer will read correctly.
10. Should you wish to install lights on other electrical accessories requiring a battery the wiring diagrams and instructions are contained in the Bombardier/Rotax supplied Engine Operators Manual.

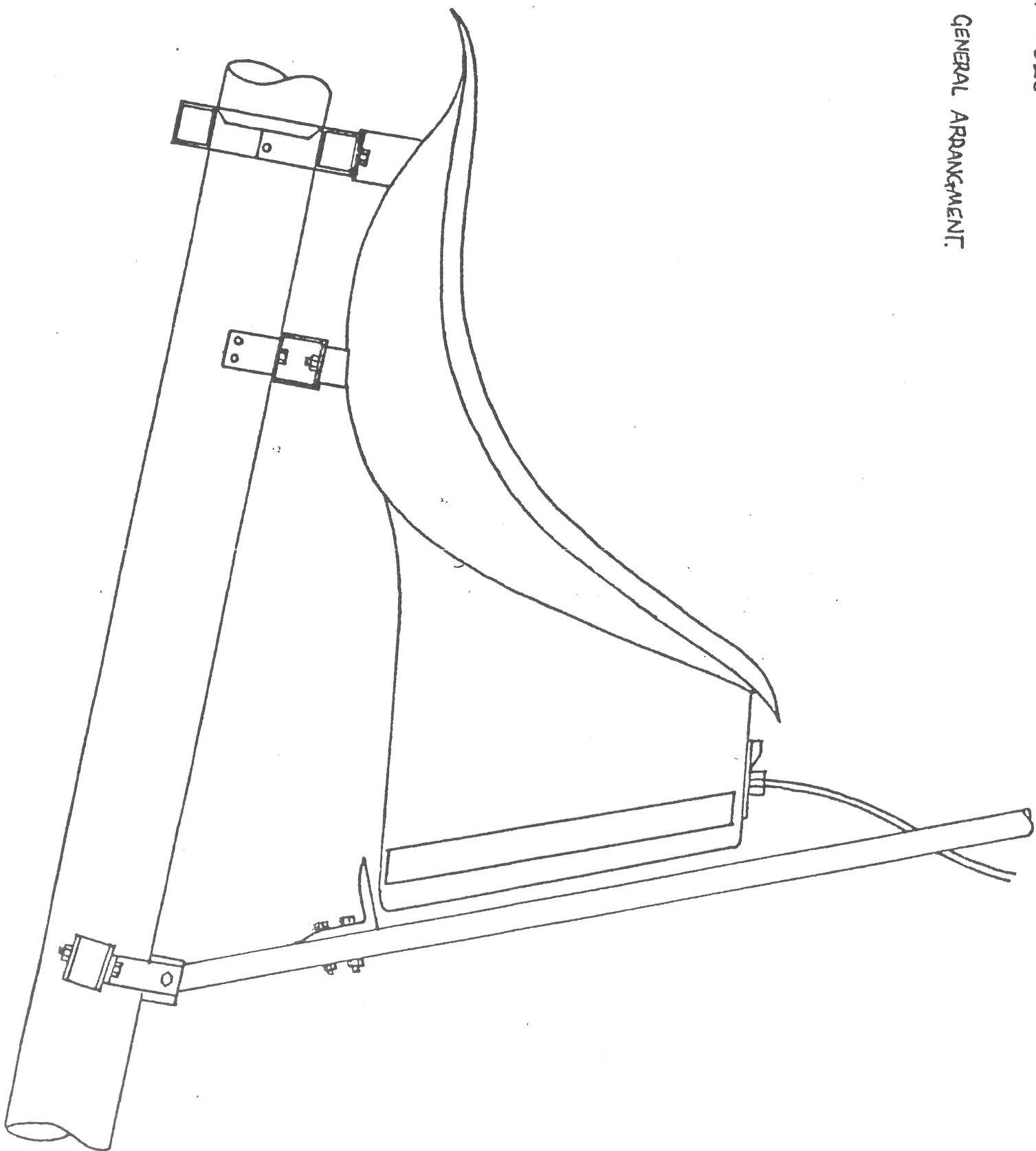
RX550 ASSEMBLY : STEP No.28

11. It may be advisable with heavy electrical installations to connect the engine ground wire (Brown) to the aircraft structure to provide common-return grounding. However this would involve re-wiring the ignition switch with either double-pole-double-throw switch or individual switches to ensure correct operation of the ignition system.

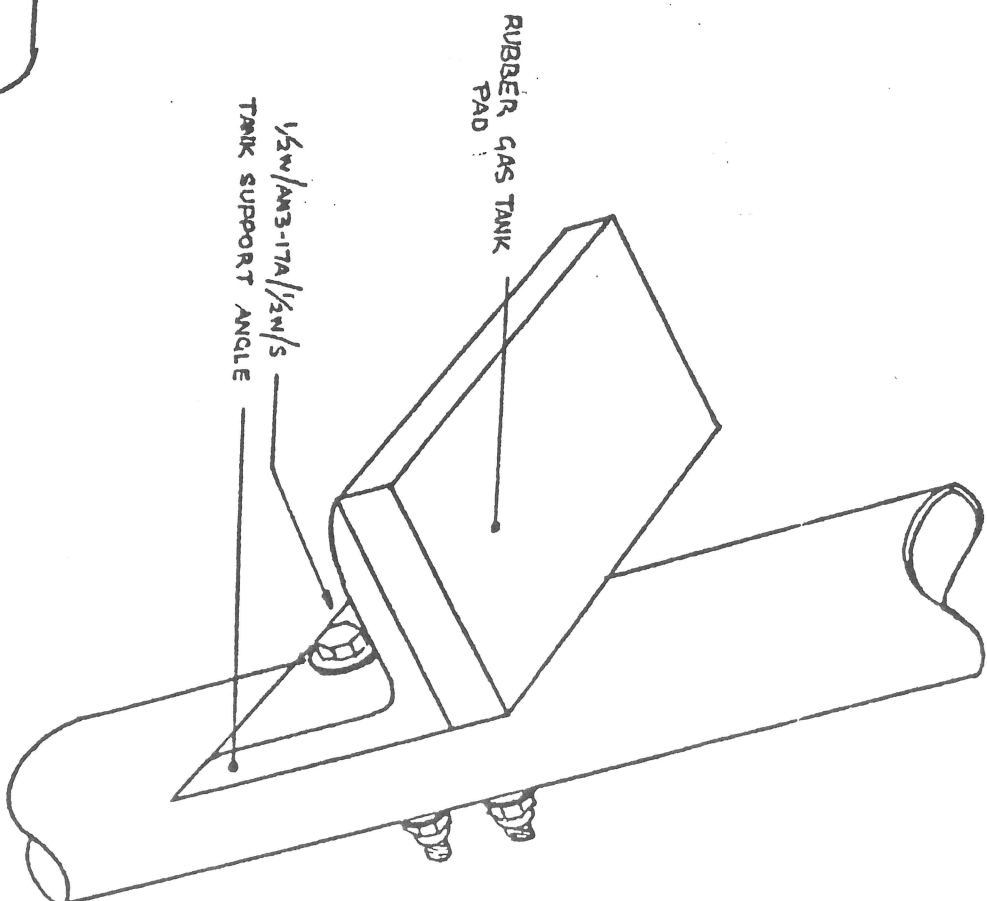
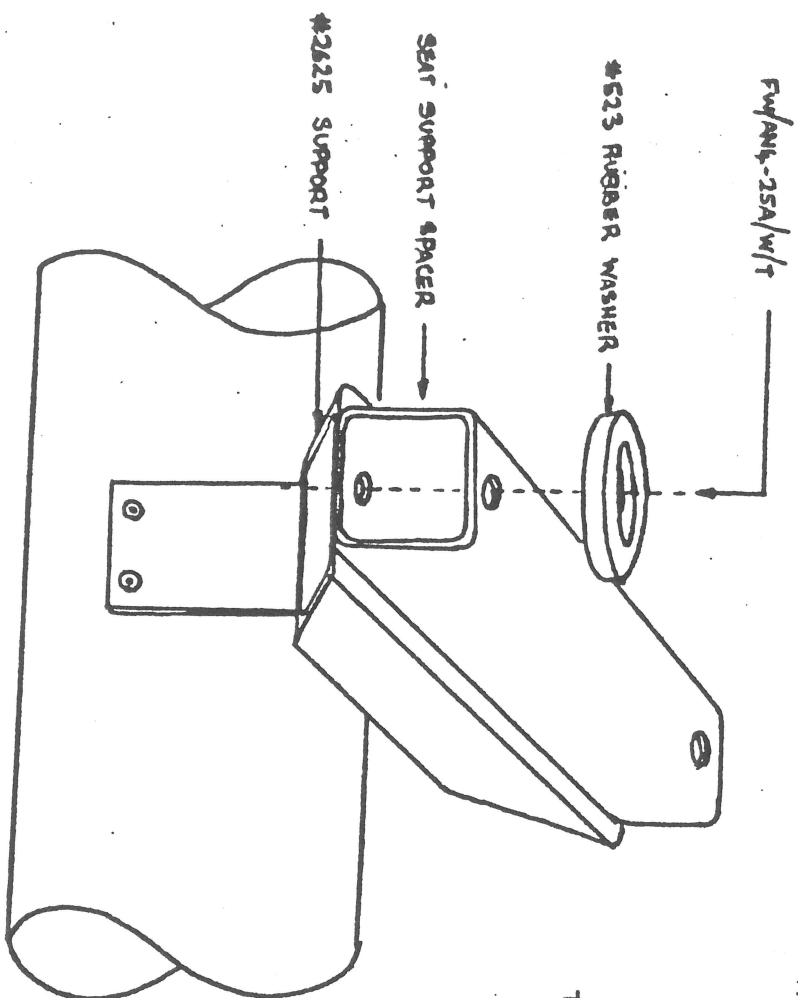
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DRG I

SEAT-TANK GENERAL ARRANGMENT.

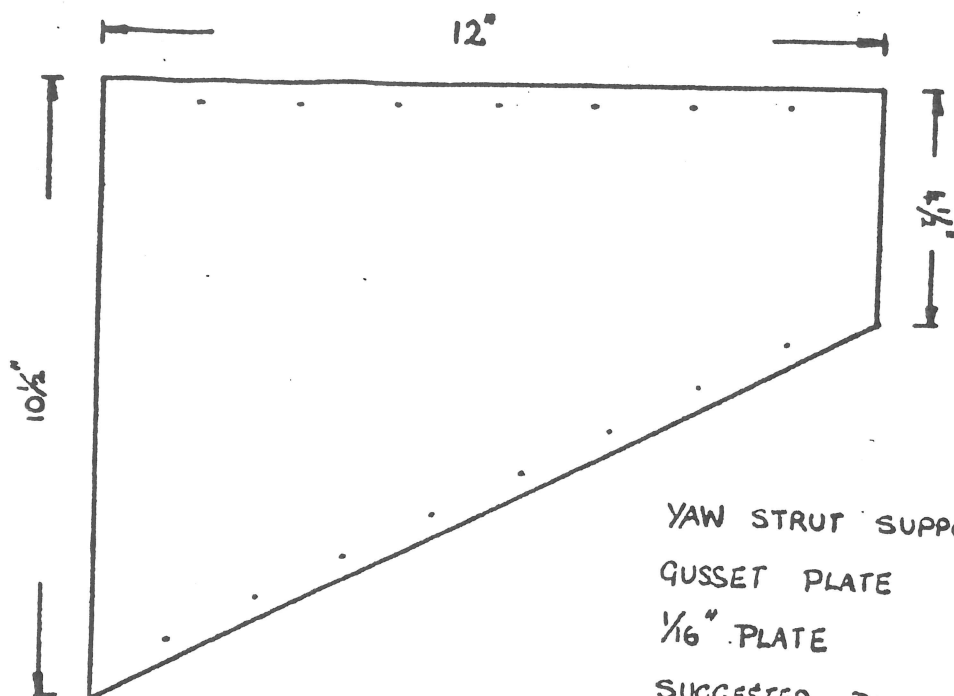


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 DRG II
 SEAT TANK DETAIL

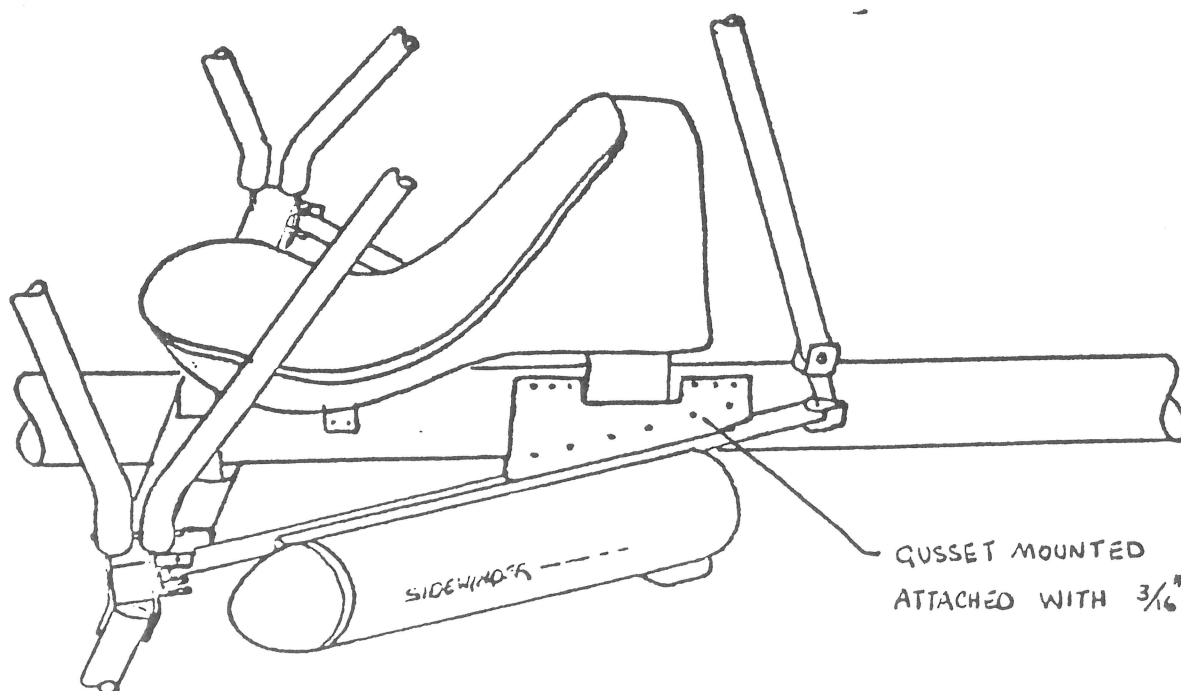


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DIAGRAM 3



YAW STRUT SUPPORT
GUSSET PLATE
1/16" PLATE
SUGGESTED DIMENSIONS.



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DIAGRAM 4

